



# **BRUNEL UNIVERSITY, LONDON**

**Topic: Drivers of Green Shipping Practices Adoption and Impact  
on Organisational Performance**

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## ***Abstract***

Green Shipping Practices (GSPs) are a new and increasing trend in the shipping industry. This appears to be a response of the shipping industry to the increasing demand for sustainability in this industry sector. While these practices are gradually becoming acceptable, it is unclear what motivates shipping firms to engage in these practices. This research explored four theoretical perspectives to identify what theory adequately explains the adoption of GSPs and the impact on organisational performance. Through robust literature review, data collection and analysis the conceptualization and definition of GSPs (Lai et al, 2011) is validated. This research through industry case study fills the existing void in literature by identifying what factors influence the adoption of GSPs and how this affects organizational performance. This research adopted a case study approach to exploring the subject area. This is because the research area is still very new and there is little data and literature in this area. The findings suggest that GSPs adoption is largely driven by coercive influences. The research identified factors that influence GSPs adoption classifying them as drivers and enhancers. The research also identified the impact of GSPs on organisational performance classifying the impact as perceived benefits and constraints. The theoretical contribution of this research amongst others include the identification of Institutional theory as plausible explanation for GSPs adoption. provides adequate explanation to GSPs adoption. Furthermore, this theory is extended to include the influence of moral conviction/values. The research also makes methodological contribution having made use of a qualitative approach in contrast to the prevailing quantitative approach used in similar studies.

**Keywords:** GSPs, adoption, Institutional Theory

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## **1. INTRODUCTION**

### **1.1 BACKGROUND TO THE RESEARCH**

The clamour for sustainable shipping has been on for over a decade now. Very recently, actions are now being taken to mitigate maritime emissions. These actions are in the form of policies and strategies that strive to reduce maritime emission through the cooperative interaction of technical, operational and market forces. Foremost in the campaign for maritime sustainability is the International Maritime Organization (IMO), an arm of the United Nations (UN) that is responsible for ensuring sustainability in maritime shipping. A recent IMO study carried out in 2009 showed that if actions are not taken maritime emission is likely to increase by up to 250% in the year 2050. On the contrary however, the successes of proposed actions are expected to reduce maritime emission by as much as 75% of its present value which will be a significant achievement in the strides towards maritime emission reduction. Several academics are also in agreement with the prospect of sustainable shipping as will be seen in subsequent sections of this research (Psaraftis & Kontovas (2010) and Kontovas & Psaraftis (2011)). Faber, et al., (2010).

On the other hand, the shipping industry is beginning to respond to environmental pressures for sustainability through the adoption of Green Shipping Practices (GSPs) but this is still in the early stages and the motivation behind this new trend is still unclear (Lai et al, 2011). While the shipping industry is beginning to adopt GSPs it unclear whether this is a proactive or a reactive approach. By proactive approach to GSPs, the research aims to identify

patterns that suggest a self/intuitive approach by shipping firms to adopt environmentally friendly practices while in contrast a reactive approach to GSPs would suggest that GSPs adoption by shipping firms is merely a response on the part of shipping firms to some form of influence/pressure from within or outside of the organisation.

It is necessary to provide a good definition for GSPs as this forms the focus of this research. GSPs have been considered as technological efforts made by shipping firms that focus on efficiency in energy consumption hence minimizing waste and negative impact on environment (Krozer et al., 2003). It has also been considered as business practices that improve environmental performance of shipping firms which are sometimes demanded by stakeholders e.g. obtaining ISO 14000 certification (in compliance with the ISM Code) (Celik, 2009). (Lai et al, 2011) simply defined GSPs as the “sustainable handling and distribution” of cargoes and although there are seemingly diverging perspectives to GSPs there is convergence in the fact that they are helpful for minimizing negative environmental impacts that result from shipping activities.

Several authors have advocated for maritime/shipping related research citing a dearth of literature in this regard as identified by Lun et al, (2011). This research through industry case study seeks to fill the existing void in literature by exploring what factors influence the adoption of GSPs and how this affects organizational performance (service and financial). This knowledge will be valuable for the development of environmental policies targeted towards the shipping industry (Lai et al, 2011), as well as development of a systematic

framework for the adoption of GSP, which will also contribute to the limited volume of literature in this regard.

It has been recently observed that organizations are increasingly engaging in voluntary environmental measures on the presumption that such actions will yield both environmental and economic returns (Lai et al., 2010a). Studies on green practices in different industrial sectors however show that many firms are still lukewarm in this regard (Zhu et al., 2008) owing to many reasons the most prominent of which is the lack of strong incentives for adopting green practices to justify the investment of the required time and resources. In the shipping sector, there are evidences of environmentally friendly actions of shipping firms; however, there is a lack of systematic framework for the adoption of green practices in the shipping industry. This research is further motivated by the presumption that contrary to the general belief that firms mainly act to maximize financial gains (Smith and Grimm, 1987) there may be other contributory reasons for firms adopting Green practices. This research seeks to investigate what other factors (asides economic incentives) influence the adoption of GSPs. The main research question to be answered is; why are shipping firms beginning to adopt GSPs and what impact does this have on organisation performance?

## **1.2 JUSTIFICATION OF THE STUDY**

In recent years, there has been a few studies around Green Practice Adoption (GPA) however not much is available with respect to GSPs. Some of these studies include the works of Evangelista, (2014) who studied GPA in logistics companies. Similarly, Hoejmose et al, (2014) also studied GPA in supply chain management



and obtained results contradictory to those of Zhu et al (2007, 2008a, 2008b) with an explanation of contextual difference as being possibly responsible for the differing results. Chou, Chen and Wang (2012) studied GPA in hospitality industry with a focus on restaurants, Kotze et al, 2014 explored the drivers of Green Information Systems (GIS), Keui et al (2015) carried out an exploratory study to identify the critical factors that influence the adoption of GSC practices in Chinese firms similar to the work of Lui and Ho (2011), There are also conceptual works that did not provide any empirical validation like the works of Har et al., (2013) and Roslan et al., (2014). The conducted literature searches on GPA showed that this is still a developing area; most of the published work can be seen to be within the last decade and particularly in the later end of the decade. Additionally, Schrettle et al, (2014) noted sustainability literature provides limited answers to the reason why firms adopt sustainability practices and how it can be of advantage to the firms' competitiveness, this is an opinion also echoed by other authors (Delmas and Toffel, (2004); Etzion, (2007); Rivera Camaro (2007). Even more profound is the fact that the only available works on GSPs are the work of Lai et al, (2011, 2013) which is only a conceptualization of GSPs and Lun et al (2013) which studied the ability of firms to adopt/implement green practices. This still leaves the questions of why shipping firms adopt green practices unanswered. This calls for more research into the area as was further emphasized by Lun et al, (2011). This is a huge gap in maritime shipping literature and this research seeks to fill this gap by helping to provide an understanding of the GSPs, what factors drive the adoption of GSPs as well as its impact on the performance of shipping firms.

This adopted the Interpretivist approach in its execution, which has an impact on research design, data collection and analysis as well as the extent of generalizability of the results/findings. Considering the adoption of GSPs, which is a real-world process, a case study was considered an appropriate research framework. This allows the researcher to observe the said phenomenon in its natural state hence enhancing theory building and testing. This study is largely exploratory as well as theory building resulting in the development on a GSPs adoption framework from the results obtained. GSPs is relatively new and very little research is available in this regards hence this research has a significant theoretical and practical implication. Single case study has been adopted for this research and access to other relevant documents helped to build greater understanding of the topic. Since GSPs is only just emerging, it is not clear whether multiple instances could have been found that fitted into the research aims and within the available time scale. The development of GSPs adoption framework was also a fundamental goal, as this would provide regulatory authorities as well as intending shipping firms with a tool to enhance GSPs adoption. To execute the case study method, semi-structured interviews were the main data collection tool but this was complimented by other relevant organisational documents. This allowed the research to achieve the required triangulation of data sources as well provide a vast amount of data about GSPs adoption and the perceived impact on the firms' performance. The research design followed an Interpretivist approach relying on a single in-depth case study on a shipping firm/port. Data collection occurred over a decent period of allowing for a robust account of the respondents. The findings were used to develop a GSPs adoption framework as will be seen in subsequent chapters.

### **1.3 PERSONAL CONTRIBUTION TO ACADEMICS AND PRACTICE**

This research stemmed from the author's quest to contribute to academics and practice. This led the author to identify a research gap within green shipping literature. In filling this research gap the author makes a theoretical contribution as well as a methodological one with practical implications and recommendations. The literature review revealed that despite increasing adoption of GSPs, the motivation by shipping was unclear. Additionally, the literature review also showed that there was no formal structure for the systematic adoption of GSPs owing largely to the absence of empirical evidence of the impact of GSPs adoption. This research fills the gap of lack of theoretical understanding of Green Shipping Practices adoption by identifying Institutional theory as a theoretical explanation for this trend. Institutional theory was observed to account for a good majority of the factors identified to influence GSPs adoption being the first contribution as no theory had been empirically tested to explain GSPs adoption. Additionally, Moral conviction/Values was observed to also influence GSPs adoption in industry a factor had not been previously identified by previous research on similar subjects. Institutional theory does not fundamentally account for Moral convictions/values in its dimensions hence this research proposed an extension of Institutional theory to include this additional factor as has been included in the conceptual framework presented in the discussion chapter. Further theoretical contributions include the observation of professional bodies that would typically exert normative influence appearing to exert coercive influence in this instance. It is argued in this research that the size, variation/scope of membership (world renowned brands etc.) of professional bodies could translate their typical normative

influence into coercive driving member organisations to adhere to its regulations in return for continued membership and legitimacy. Etzion, (2007) and Lin and Ho (2010) both stated that contextual difference (size, different country of study or industry sector) is likely to result in differing results, an example is the Hoejmose et al, (2014) and Zhu et al (2007, 2008a, 2008b) where the country of study was cited as the possible reason for the differing results.

Methodologically, this research explored the use of qualitative methodology as opposed to the vast array of quantitative studies on similar subject areas as has been highlighted in the literature review. The approach proved beneficial providing in-depth understanding of the researched area and helping to identify and understand the factors responsible for GSPs with insight of how adoption occurs.

Practical implication of this research includes the recommendation of increased industry and academic partnership particularly in the development of theory driven solutions with ease of application to foster continued GSPs adoption. The knowledge of the identified perceived benefits and constraints can also be used to develop strategies that provide incentives and support to shipping firms to further encourage GSPs adoption.

#### **1.4 AIM OF THE RESEARCH**

The aim of this research is to investigate the factors driving the adoption of GSPs in the shipping industry as well as the impact of this on the organisational

performance from empirical evidence. Specifically, the objectives of this research are;

1. To identify the possible factors influencing the adoption of Green Shipping Practices
2. To examine theoretical underpinnings to explain the adoption of Green Shipping Practices
3. To provide empirical evidence of the impact of GSPs adoption on organisational performance

## **1.5 RESEARCH QUESTIONS**

Through robust literature review and conduction of field exercise the following research questions are to be answered during this research:

1. What are the factors responsible for the adoption of Green Shipping Practices/What drives Green Shipping Practices adoption?
2. What theory can sufficiently explain the adoption of Green Shipping Practices
3. How does the Green Shipping Practices adoption impact on shipping firms?

## **1.6 RESEARCH STRUCTURE**

This section presents a preview of the thesis. Chapter one of the thesis introduces the research aim and objective with a description of the research context highlighting the research gap and establishing justification for the research in section 1.2. Chapter two will presents a literature review and

theoretical framework of the research highlighting theories identified to likely explain GSPs adoption with examples of their application to similar research. Chapter three will discuss the research methodology chosen for the research. Qualitative research methodology is considered appropriate for this research working through an inductive approach and interviews will be used as the data collection technique. In Chapter four, the data collected will be presented and analysed resulting in findings that will answer the research questions hence filling research gaps identified in chapter one. The fifth chapter will discuss the findings in respect of the research questions set out at the start of the research providing direct answers to the research questions highlighting where findings agree with literature and where they differed giving possible reasons for the observed variation. The concluding chapter summarises the thesis demonstrating how the objectives set out at the beginning of the research have been met with the inclusion of managerial and theoretical implications of the research. It will also mention the limitation of the research recommending areas of future research.

## **2. LITERATURE REVIEW**

### **2.1 SHIP OPERATION MANAGEMENT**

This section seeks to provide some insight into the development of shipping operations. This is needful to fully comprehend the robustness of the shipping business and the complexities of its operations. The section begins with a brief history of shipping operations before delving into the details of shipping service design and planning. The section further highlights the peculiarity and complexity of the shipping industry discussing the industry's operations efficiency and duplicative jurisdiction as some of its pros and cons respectively.

#### **2.1.1 LINER SHIPPING**

This section presents a concise history of liner shipping as presented by Ducruet and Notteboom (2012). It is reported that McLean (1956) heralded the beginning of containership by launching the first containership called Ideal X. It took another ten years for the first transatlantic container service to take place and this was between the United State East Coast and North Europe. This marked the start of long distance scheduled liner services. In 1968, the first specialized cellular containerships were delivered. About two years later (1970s), the standardization of container sizes coupled with awareness about associated cost savings and other advantages resulted in a rapid expansion of containerization process (Rodrigue and Notteboom, 2009; Levinson, 2006). Since then container liner shipping has been the widely growing and is currently responsible for transportation of more than half of world's trade.

Liner shipping involves the transportation of containerized cargo along predefined service routes (Agarwal and Ergun, 2008). Development of such a complex system requires planning at several stages. Agarwal and Ergun (2008) classified these stages into three namely;

- Strategic Planning: concerned with deciding on the optimal number and mix of ships in a fleet (Agarwal and Ergun, 2008)
- Tactical Planning: deciding on ship route and allocation of fleet these routes. This is referred to as ship scheduling (Agarwal and Ergun, 2008)
- Operational Planning: concerned with which cargo to accept or reject and for which service route. This decision also referred to as cargo routing (Agarwal and Ergun, 2008)

### **2.1.2 CONFIGURING LINER SHIPPING SCHEDULE AND NETWORKS**

The configuration of liner shipping is designed to meet the growing demand of global supply chains. This configuration considers factors such as frequency, accessibility and transit times. The design of liner networks implicitly encompasses trade-offs between customer's requirement and corresponding cost implications. This calls for optimal network design for efficient ship utilisation. The more optimal a design network is from the carriers view however, the less convenient it is for the shippers (Notteboom, 2006). According to Ducruet and Notteboom (2012), one of the ways to cope with the complexity encountered in liner network design is through bundling. This can be in two forms; within a single liner services or combining two or more separate liners. Within a single a liner, this involves picking up container cargo at various ports along the route rather a direct end-end service. The second option is combining



two or more separate liners which presents three further options as follows; hub/feeder networks, interlining and relay.

### **2.1.3 DESIGNING A LINER SERVICE**

Designing a liner service begins with analysing the intended trade route. This analysis covers supply and demand patterns as well as market profiling. Factors to be considered on the supply side analysis include vessel capacity and utilisation, vessel size distribution, configuration of existing liner services, existing market structure and the port call patterns of existing operators. On the demand side, factors for consideration include characteristics of the market, geographical distribution of cargo and cargo imbalances. In addition to this, market profile analysis helps to estimate possible volatility and seasonality of demand. The interaction between demand and supply determines freight rates and the overall profit potential of that service. Once all the mentioned analysis have been completed, planners begin making decision on necessary design variables. Typically, these design variables include the type of liner service to be developed, the number port to visit and order of port calls (combined with port selection process), vessel (speed, frequency, size) and fleet mix. We further expatiate on some of these design variables in later sections.

#### **Port of Call**

Number of port visited directly affects total voyage time. The more ports visited, the longer the voyage time and vice versa. Reducing the number of port calls allows for increase in the number of round trips and hence minimising the number of vessels required for that specific liner service. Fewer ports calls

however mean limited access to cargo catchment areas. A decision to add more port calls can be a good source of revenue if the accrued costs from added calls can be offset by revenue growth. Port selection is a complex process and this is highlighted by Wiegmans et al. (2008) who argue that port selection can be a strategic competitive advantage.

### **Speed**

Vessel speed is predominantly determined by the technical specifications (i.e. design speed) of the vessel, in addition to this other factors such as bunker price, environmental impacts and market capacity situation also influence speed decision. Examples of these can be seen in Cariou and Notteboom (2011), Notteboom et al., (2010), Notteboom and Vernimmen (2009). The combination of the number of ports-of-call and speed together determine the total voyage time. Despite significant theoretical research into liner shipping optimisation, solutions proffered are rarely effective in practice due to large degree of uncertainties. These uncertainties could be due to a number of reasons, which include weather conditions and port disruptions. A practical approach used by shipping lines to cope with these uncertainties is the instruction of time buffers. This is very effective however it results in corresponding increase in roundtrip time.

### **Frequency**

Generally, weekly service is the norm for liner shipping. Service frequency and vessel roundtrip time essentially determine the number of vessels required for the liner service. Number of vessels and anticipated cargo for the route in turn

determine optimal vessel size and fleet mix for a particular liner service. Owing to economics of scale, larger vessels are typically assigned to longer distance (longer cargo-rich routes). Decisions made through a combination of these factors determine the success of a shipping liner.

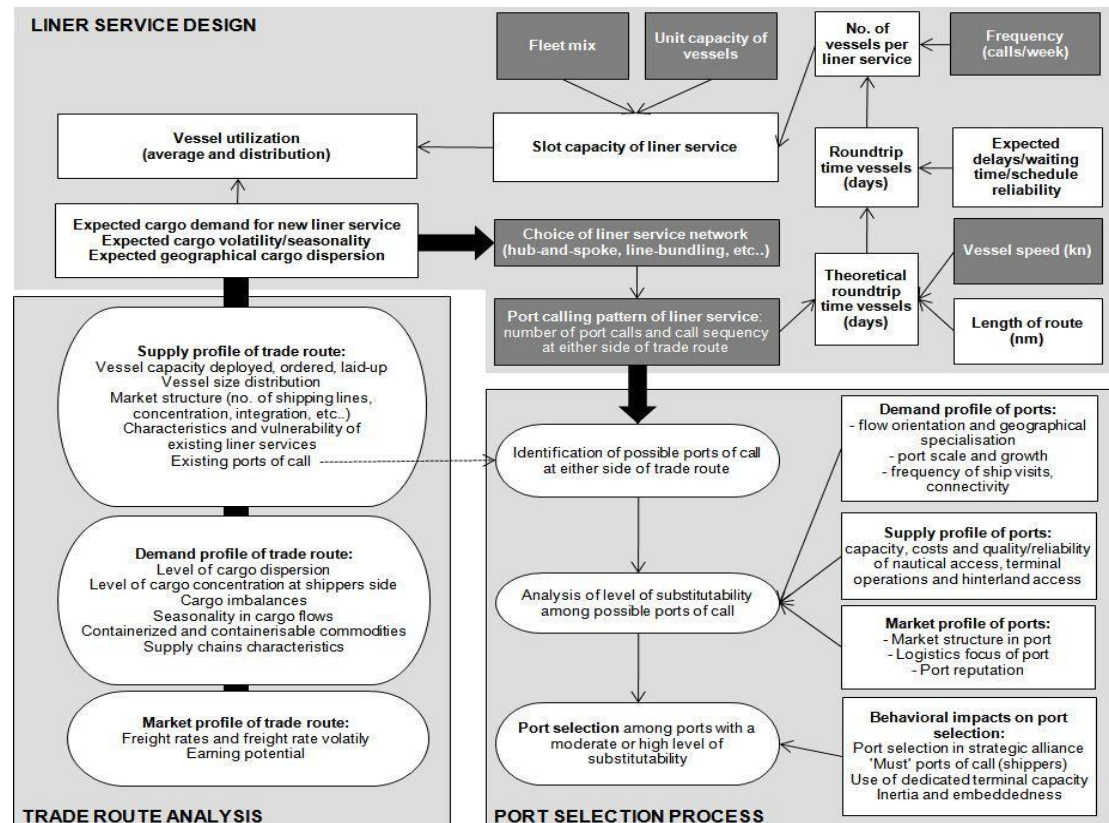


Figure 2.1: Liner service design process (darkened areas represent the design variables) (Ducruet and Notteboom., 2012).

Having discussed the decisions and design variables considered in developing and configuring a liner service, it is worthy to mention some additional factors that are taken into consideration. These factors are not in any way less significant in fact they are just as important as will be seen in the following paragraphs. Considering that any individual liner service is a complimentary

part of a regional and eventually global maritime network we present the influence and relevance of such a relationship.

### **Influence of Distance**

Shipping network distance has been found to have geographically expanded particularly within the last decade. The work of Ducruet and Notteboom (2011) showed that long shipping distance doubled from about five to ten million kilometres between 1996 to 2006 comprising of about 7%-10% of worldwide traffic within the said time. They attribute this increase to strengthened trans-Pacific ties and rapid progress in technology in shipping industry. Their work further emphasised that distance has a profound influence on sea traffic showing that most traffic occurs between direct and short distance routes (distance of 500 km or less). It was estimated that top 100 direct port links accounted for about 52% of world traffic in 1996 this percentage dropped to about 39% in 2006 showing that shipping liners were tending towards longer route networks also confirming the strengthened relationship in trans-pacific ties Ducruet and Notteboom (2012).

### **Port Centrality**

In assessing port performance, throughput is usually the performance indicator. Good as this is, it may not fully represent the overall performance of the port. Another helpful dimension in performance analysis is network perspective which allows a port's relative connectivity with other ports. Ducruet and Notteboom (2011) identified two measure of port centrality namely;

- Betweenness; which "counts the number of positions of a node on possible shortest paths among all nodes in the entire network" (Ducruet and Rodrigue, 2011).
- Number of adjacent neighbours; which counts the number of ports connected to a given port (Ducruet and Rodrigue, 2011).

Wasserman and Faust, (1994) suggest that these two measures are relevant contribution to theoretical network configurations as proposed by Fleming and Hayuth (1994). An analysis of top 25 of the world central ports shows the effectiveness of these measures. It showed with a few exceptions that very central ports were able to very easily increase their network path connections (Guimera et al., (2005); Deng et al., (2009)). The exceptions make room for suggestions that the relationship may be more complex than presumed.

## **2.2 PECULIARITY OF THE SHIPPING INDUSTRY**

This section highlights the importance of shipping industry. This necessary to distinguish between this sector and other business sectors, furthermore, it is needful for the justification of this research as it could be argued that similar research has been carried out in business areas however the emphatic peculiarity of the shipping industry is highlighted in the points below (World Shipping Council, 2009).

## **2.3 ECONOMIC PECULIARITY**

Shipping is the bedrock for global commerce, no other business sector can boast of such prowess as up to 90% of world trade is seaborne even more so in the most cost-effective and reliable manner (World Shipping Council, 2009):

- Shipping acts as a conduit for world trade: It is the primary aqueduct of world trade and a focal part of international economic development, which is largely responsible for the easy access, and availability of diverse spectrum of low-cost products. In 2008 alone, about 1.3 billion metric tons of cargo was estimated to have been transported around world container ship traffic. These cargos comprise of varying types of goods from everyday consumer goods to heavy machinery most of which could not have been transported through any other means (World Shipping Council, 2009);
- Shipping Efficiency: It is common knowledge that the efficiency of shipping easily surpasses that of any other means of transportation. In one year, a single large containership could carry over 200,000 containers. While vessels vary in size and carrying capacity, many liner ships can transport up to 8,000 containers of finished goods and products. Some ships can carry as many as 14,000 TEUs (twenty-foot equivalent units). It would require hundreds of freight aircraft, many miles of rail cars, and fleets of trucks to carry the goods that can fit on one large container ship. In fact, if all the containers from an 11,000 TEU ship were loaded onto a train, it would need to be 44 miles or 77 kilometres long (World Shipping Council, 2009);
- Cost and Environmental Effectiveness: based on economies of scale, shipping provides low cost in comparison to other forms of transportation (to transport a 20-foot container of medical equipment between Melbourne, Australia and Long Beach, California would cost approximately \$2,700 using container ship the same amount of shipment

would cost more than \$20,000 using airfreight). Furthermore, its environmental efficiencies are much higher than other forms of transportation (World Shipping Council, 2009);

- Shipping is a global economic engine and a major global enterprise; this sector directly employs hundreds of thousands of people and plays a crucial role in stimulating job creation and increasing gross domestic product in countries throughout the world. Moreover, as the lifeblood of global economic vitality, ocean shipping contributes significantly to international stability and security.

This section highlights the importance of the shipping industry noting discussing four main points. This helps to understand the relevance of this shipping industry and its contribution to global trade and economic prosperity. It further highlights the uniqueness of this sector discussing the cost efficiency it can achieve ahead of other forms of transportation. This makes it the preferred transport option for global trade. The discussed peculiarity is not without its challenges as will be seen in the next section below.

## **2.4 COMPLEXITY OF THE SHIPPING INDUSTRY**

The complexity of the shipping industry clearly distinguishes it from other business sectors. Some of these complexities are discussed below. These complexities further justify the need for a research as these in this sector. It needful to know how internal and external forces interplay amidst such complexity as these affects the performance of firms (International Council on Clean Transport, 2011).

#### **2.4.1 GLOBAL COMPLEXITY OF THE SHIPPING INDUSTRY**

The global nature of shipping business is a challenge to coherent efforts for the development of practicable carbon emissions policy. Fleet could be owned, registered to, and operating in diverse parts of the world making it difficult to directly impose any regulations. Due to the mobility and trans-boundary nature of operations there's a need for a complex range of political, practical, and administrative requirements and regulations than that required in other fixed operation economic sectors. Some of the profound challenges are: international emissions accountability, enforcement of regulations, equitably among diverse jurisdictions, maintaining competitive fairness and balance within incoherent global business structure (International Council on Clean Transport, 2011).

#### **2.4.2 DUPLICATIVE JURISDICTION IN THE SHIPPING INDUSTRY**

Because shipping operations span across diverse geographic, national, and regulatory jurisdictions, there is a tendency for duplication of regulations if each country were to issue their own regulatory requirements, this would further result in inefficiency, and incompatibility. The introduction of a central governing body such as the IMO reasonably helps with minimizing these effects (International Council on Clean Transport, 2011).

#### **2.4.3 THE SHIPPING INDUSTRY AN INTEGRATED SUPPLY CHAIN**

The impact of maritime shipping on the whole huge, complex, and inter-connected global supply chain cannot be undermined. Any change can result in a spiralling effect across the whole chain with profound economic and environmental consequences (e.g. the implementation of carbon rules may increase cost or affect the availability of certain goods; this can in turn drive



consumers to purchase alternative products with greater carbon footprint). The implication of this that careful consideration must be taken before any adjustments can be made in any area of business. This in turn means a lot of time will be required for the implementation of regulation/policies. Furthermore, alteration in liner services can adversely affect inventory management which will consequently alter demand and supply as well as other carbon intensive infrastructure and services such as storage, utilities, and ground transportation (International Council on Clean Transport, 2011).

## **2.5 IMPORTANCE AND RATIONALE**

The impact of sea transport is one of immense importance to the world's economy. The international shipping industry is said to be responsible for the "transportation of about 90% of world trade and is vital to the functioning of the global economy" (International chamber of shipping, 2011). This immense contribution does however come at a price, one of which is its detrimental effect on the environment. Hazardous emissions from maritime transport have been attracting increasing attention particularly in the last decade (Qi and Song, 2012). Maritime sector is the third highest contributor to global emission contributing over 3% (Buhaug, et al., 2009). The International Maritime Organization (IMO) estimated ships 2007 emitted 1046 million tonnes of CO<sub>2</sub>. Containerships are about the largest contributors to the problem. Statistics for year 2007 showed that they emitted over 230 Mmt of CO<sub>2</sub> having consumed over 70 million metric tons (Mmt) of bunker fuel. This accounts for about 22% of energy consumption and CO<sub>2</sub> emissions from international shipping (Buhaug, et al., 2009). Furthermore, containerships compared to bulk shipping, crude oil tankers and general cargo ships emits (1.3 times, 2.2 times and 2.5 times) more

respectively (Corbett, Wang, & Wine brake, 2009). Due to anticipated increase in world trades, emissions from containerships are also expected to sporadically increase until 2050 (Ocean Policy Research Foundation, 2008). Owing to this, the International Maritime Organization in 2009 set a target at a daunting 15% reduction of emissions in the maritime sector by 2018 (Buhaug, et al., 2009). This push has triggered massive research into minimizing carbon footprint of maritime shipping requiring synergy between industry and academia.

## **2.6 GLOBAL AND NATIONAL DRIVERS FOR EMISSION REDUCTION**

### **2.6.1 CLIMATIC IMPACT**

Questions have been raised concerning the impact of the shipping sector on global climate as it has been presumed that emissions from shipping operations have direct impacts on human health, contributing to acidification and eutrophication as well as influencing “radioactive forcing” (RF) of climate due to the chemical compounds that are emitted some of which are carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compounds (VOC), sulphur dioxide (SO<sub>2</sub>), black carbon (BC) and particulate organic matter (POM), each one of these compounds having a peculiar effect on the environment. For instance, emitted NO<sub>x</sub> leads to the formation of tropospheric ozone (O<sub>3</sub>). The dominant component of the aerosol resulting from ship emissions is sulphate (SO<sub>4</sub>), which is forms as a result of oxidation of SO<sub>2</sub>; contained in sulphur in the fuel. Emissions also result in changes in the level of trace species in the atmosphere. Under atmospheric influences, these emissions undergo certain reactions and alter microphysical processes. The comprehensive effects of emissions on climate are complex however they have somewhat

summarised in the diagram below. (INTERNATIONAL MARITIME ORGANIZATION, 2009)

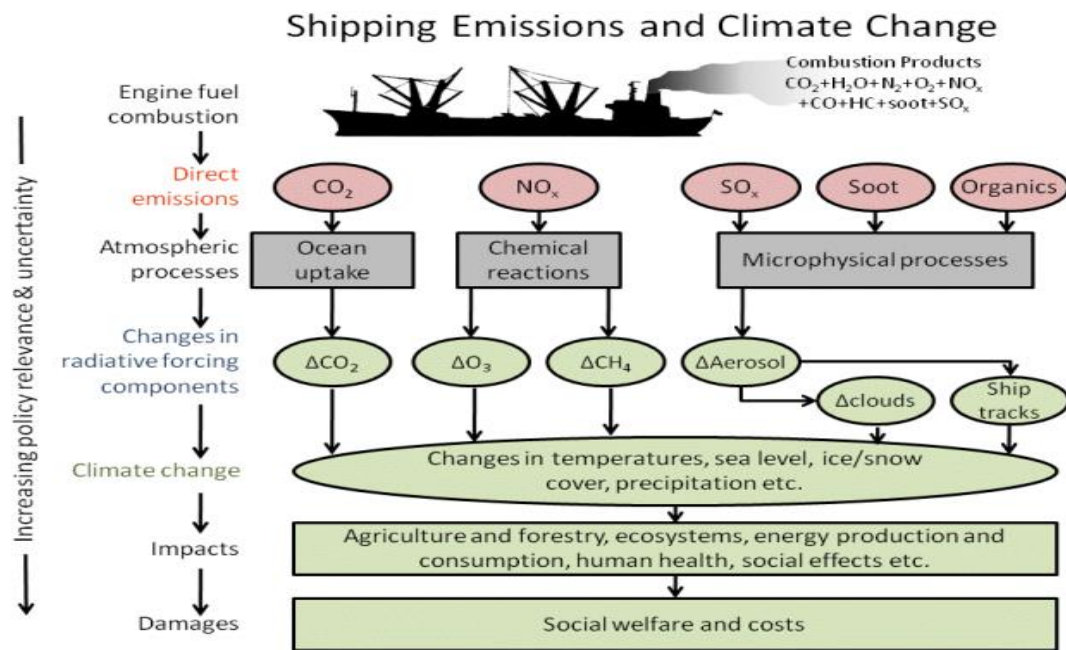


Figure 2.2 showing a schematic diagram of the effect of emission from the shipping sector (International Maritime Organisation., 2009)

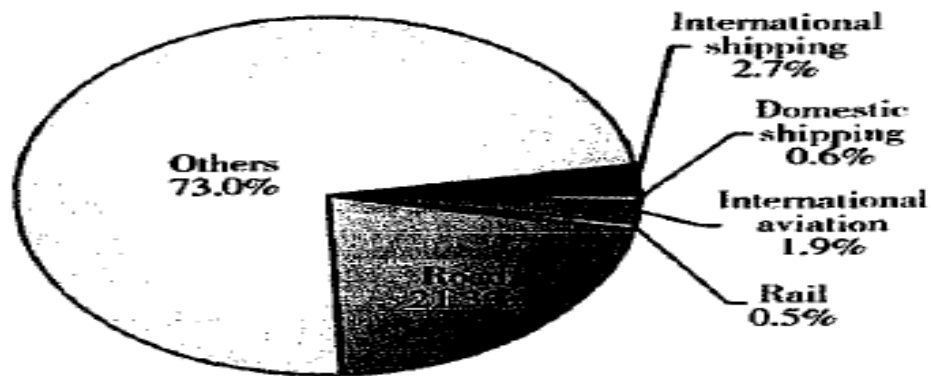
A summary of the figure above is given in the bullet points below stating the causes and effect of shipping emission.

- Emitted CO<sub>2</sub> has a warming effect (positive RF);
- NO<sub>x</sub> results in the production of tropospheric O<sub>3</sub> (positive RF) and a reduction of ambient CH<sub>4</sub>, having a cooling effect (negative RF);
- Sulphate particles (negative direct RF);
- Soot particles (positive direct and indirect (snow) RF)
- Formation or change in low-level clouds (negative indirect RF)

(International Maritime Organisation, 2009).

#### **2.6.1.1 TREND IN CO<sub>2</sub> EMISSION FROM MARITIME**

With massive development in maritime operations have also come great disadvantages. A major one is the impact on the environment. As has been earlier stated, the maritime industry is responsible for over 3% of the global emissions (Buhaug, et al., 2009). This amount of environmental pollution is forecasted to be able to increase global temperature by up to 20°C above pre-industrial level likely causing severe global consequences and endangering the survival of several aquatic species. A further increase of up to 60°C above pre-industrial levels can end life within a few years. Hence there is an immediate need to begin to reduce global greenhouse gas (GHG) emissions. The Intergovernmental Panel on Climate Change (IPCC, 2007) concluded greenhouse gas emissions have to be 50%-85% below current levels in 2050. From present indications however, there only seems to be a significant increase in global GHG emissions. This is alarming (Solomon et al., 2007) hence; all hands have to be on deck to tackle this life threatening challenge.



**Fig. 1 Global CO<sub>2</sub> emissions**

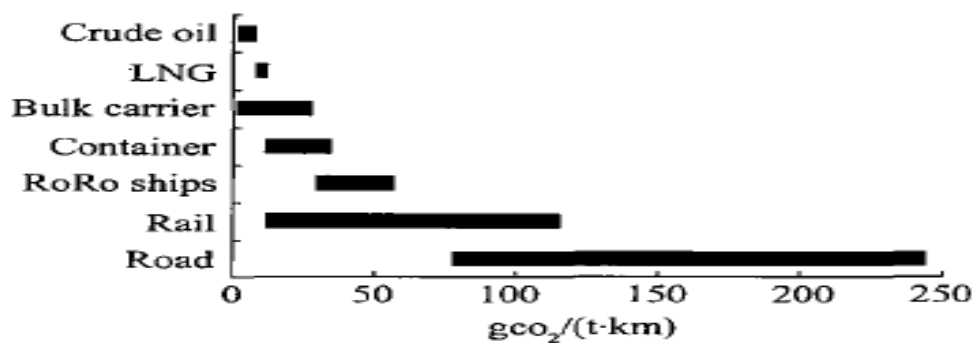
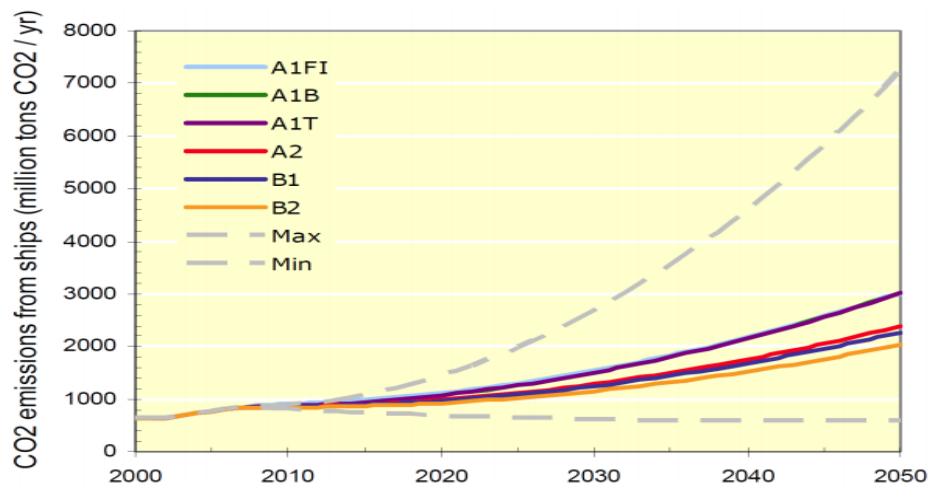


Figure 2.3 showing a comparison of CO<sub>2</sub> emission from ships to that from other transport means (Sherbaz & Duan., 2012).

The figure above shows a comparison of CO<sub>2</sub> emission from ships to that from other means of transport it is forecasted that if preventive measures are not taken, CO<sub>2</sub> emissions from ships will be more than double by 2050 (Eyring et al, 2009). The figure below clearly shows this with forecast rising to about 15% from a present value of 3%.

### Projected Growth of Shipping Emissions to 2050



IMO: 150 -250% increase in CO<sub>2</sub> emissions relative to 2007

3% of CO<sub>2e</sub> emissions today



15% in carbon constrained world of 2050 ?

Figure 2.4 showing the projected Growth of Shipping Emissions to 2050 (UK Committee on Climate Change, 2008)

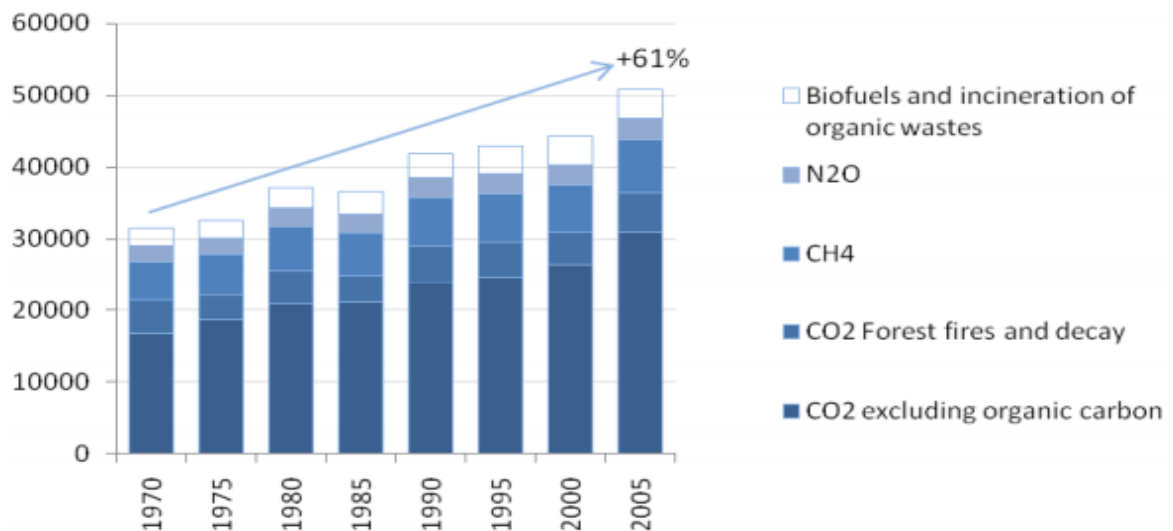


Figure 2.5 showing the increasing trend of Green House Gas emission from 1970 to 2005 (OECD., 2010).

The figure above (Figure 2.5) shows the continuously increasing trend of Green House Gas emission from 1970 to 2005. Figure 2.5 shows that total fossil fuel-related CO<sub>2</sub> emissions increased from 20.9Gt in 1990 to 28.8Gt in 2005, with transport sector accounting for between 4.58 (in1990) to 6.63 (in 2005) Gt, this represents an approximate increase of 45% (IEA, 2009). The World Energy Outlook 2009, further suggest that global energy-related CO<sub>2</sub> emissions is likely to increase to over 40Gt in 2030 and transport emissions would be responsible for over 9Gt of that. This estimate is shown in the graph below (Figure 1.5)

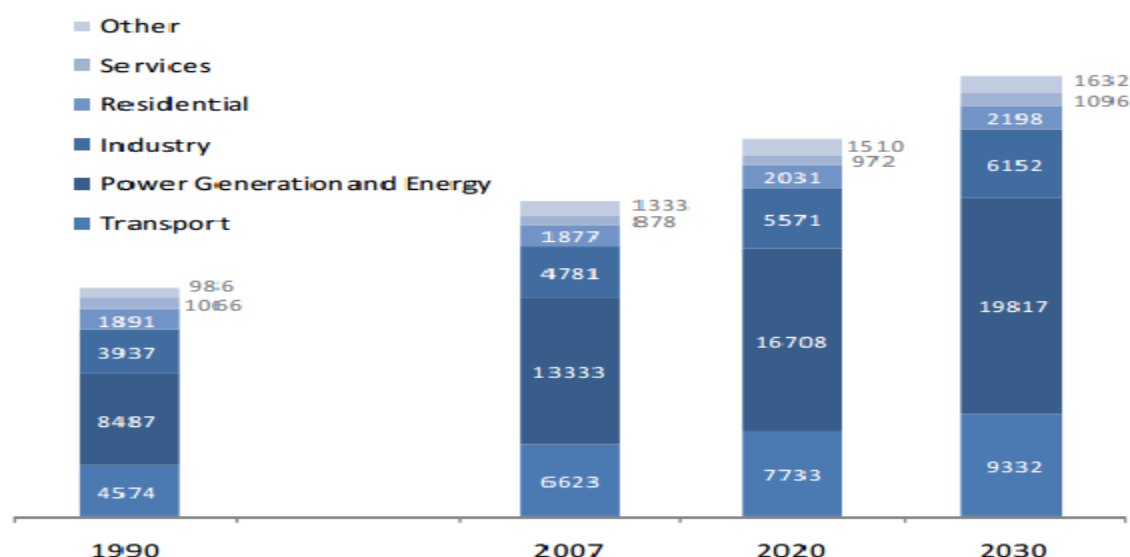


Figure 2.6 showing the forecasted increase in CO<sub>2</sub> emission to 2030 (OECD, 2010)

The set of figures above have shown the trend and forecasted estimate of CO<sub>2</sub> emission by the transport sector, the shipping industry being a stakeholders is however responsible for approximately 3% of global CO<sub>2</sub>, 14%-15% of global NO<sub>x</sub> and 16% of global SO<sub>x</sub> emissions (Buhaug et al., 2009; Endresen, 2007). The shipping industry which plays a critical role in the global economy through intercontinental trade, bulk transport of raw materials, and the import-export

may then be considered as a necessary evil. The only option is to devise a way to continue to enjoy the benefits of this sector while mitigating its environmental hazards.

### **2.6.2 ECONOMIC IMPACT**

In a report by Carbon Disclosure Project (CDP) Global 500<sup>1</sup> titled "Accelerating low carbon growth" published in 2011, the carbon reduction activities of the world's largest public corporations were examined. A ten-year historical survey found that majority has embedded climate change actions in their business strategy. Global professional services firm PwC on behalf of CDP and it emphasized the growth of Senior-level awareness in energy efficiency and related increase in profitability compiled the report. The survey analysed responses from 396 of the world's largest companies and it was revealed that 68% have climate change as a core part of business strategies an increase from the previous year's figure of 48% (CDP., 2010).

Interestingly, they also found a correlation between higher stock market performance and profitability in these companies over time (companies with a core focus on climate change provided investors with almost double the average total return). Some quotes are presented to emphasis this point. Paul Simpson, CEO of the Carbon Disclosure Project stated that "The improved financial performance of companies with high carbon performance is a clear indicator that it makes good business sense to manage and reduce carbon emissions. This is a win-win for business – the short ROIs many emissions reducing activities have, can help increase profitability. Companies yet to take action on climate change



will have to work hard to remain competitive as we head towards an increasingly resourced constrained, low carbon economy” (CDP, 2010). Furthermore, Steve Waygood, the head of sustainability research & engagement at Aviva Investors, the asset manager also stated “We believe that the external costs of greenhouse gas emissions will become internalized into company cash flows and profitability. Managing greenhouse gas emissions is therefore essential to delivering sustainable shareholder returns. There remains huge potential in companies for achieving cost effective emissions reductions. This is why we are founding signatories to the Carbon Action initiative.” (CDP., 2010).

Increasing oil prices, risk associated with energy supply and influence of the commercial returns on investments owing to emissions reduction activities has further influenced climate change as a topical boardroom issue. It is estimated that more than 59% of reported emissions reduction activities delivered payback in three years or less according to company submissions. This estimation includes energy efficiency projects (building fabric, building services and processes), low carbon energy installations and staff behavioural change. It was also gathered that 65% of companies now offer employee incentives for emissions reduction compared to 49% in 2010 (CDP, 2013).

## **2.7 THE GREEN IDEOLOGY**

The “Green” ideology is gradually growing to become a widely acceptable concept. This has presented both a challenge and an opportunity to organisations depending on several factors, which include but not limited to stakeholder interests, organisational perception and ability, industry sector,

institutional norms etc. Generally, the green ideology is perceived to enhance organisational competitiveness, improve legitimacy and highlight organisational environmental responsibility and consumer sensitivity. It is becoming increasingly common that firms look beyond their internal process to include environmental responsibility in their entire product life cycle from raw material all through to till it reaches the consumer. Due to increasing environmental issues and problems surrounding diminishing resources “Green” ideology has been extended to several industry sectors. This is usually depicted by the addition of other words to the word “green” to highlight the particular industry being discussed. ‘Green supply chain management’ (GSCM) emerged by the integration of environmental consideration into supply chain management which has now been widely accepted by many proactive organisations as highlighted by Zhu and Sarkis, (2004). Part of the focus of GSCM is to foster public awareness (suppliers and customers) to environmental issues and to implement friendlier environmental practices such as clean production and ISO 14001 certification where possible.

Similarly, “green design” (European Commission, 2009) is a widely accepted concept in several organisations irrespective of their industry. In this, organisation systematically factor in the environmental impact of their processes and product with the intention of minimising the negatives. This was previously highlighted by Lewis et al. (2001) who stated that “companies may address environmental aspects as a part of their product development process”. This has been found to have a cost saving and increased productivity effect on practicing organisations as the works of Tsoulfas and Pappis, (2006) reveal.

Handfield et al. (2002) brought to focus the impact of environmental management in an organisation's purchasing activities highlighting its importance to the corporate sustainable enterprise debate hence the development of the phrase 'green purchasing' which took into account the environmental impact of organisation's purchasing activities as well as those of the product being purchased hence the need to collaborate with suppliers that shared the organisation's green vision (Zhu et al., 2005).

Lai et al. (2011) conceptualised the idea of Green Shipping which emphasises environmentally responsible shipping without compromising the competitiveness of the organisation. This research seeks verification of this concept as well as its impact on practicing organisations. As previous research in other industry sectors noted, it could result in increased productivity (Tsoulfas and Pappis, 2006). It is desirable to see impact in this sector.

There exist in literature a good number of other environmentally conscious concepts which raise the awareness for environmental responsibility in different areas of organisational activities e.g. industrial ecology, environmentally, cleaner production, green manufacturing etc. (Hui et al., 2001; Nagel, 2003; Ehrenfeld, 2004; Rusinko, 2007; Shi et al., 2008).

### **2.7.1 GREEN PRACTICE ADOPTION LITERATURE**

Evangelista, (2014) analysed factors influencing the adoption of green practices amongst third party logistic companies (3PLs) in Italy. Using the case study

approach the research examined 13 SMEs in the logistics sector and found that the size of the organization influenced the extent of implementation of green initiatives (larger organizations seemed to be more environmentally aware). Factors that were found to profoundly drive the implementation of green initiatives include senior executives support, government support (not particularly through regulations but through the provision of motivational incentives), customer initiatives and competitor influence. The research also identified some limitations to the implementation of green practices, which include uncertainty about the payback on investment and effort imputed, lack of a precise regulatory framework, lack of awareness amongst customers and insufficient human resources. Hoejmose et al, (2014) studied the factor driving the adoption of coercive or cooperative GSCM practices. They draw on previous research on the influence of institutional theory to develop a conceptual model to test their hypothesis using quantitative survey from 198 UK based companies. Their research found that coercive and cooperative GSCM practices are driven by very differing factors. Coercive GSCM practices are driven by downstream customer demands, which compelled firms to impose green requirements on their suppliers. Cooperative GSCM is however found to be driven by institutional pressures, which encouraged firms to implement green practices across their supply chain. Their findings were contradictory to those of Zhu et al (2007, 2008a, 2008b) however the explanation for the contradiction could be contextual since the former was carried out in UK and the latter was carried out in China. Chou, Chen and Wang (2012) combined Innovation Adoption Theory and Theory of Planned Behaviour to examine the behavioural intention (BI) to implement GPs in the restaurant industry in Taiwan. From literature they

proposed constructs on Innovation adoption to likely influence the attitude in TPB in addition to subjective norm (which they suggested to be relative to Social influence) and Perceived Behavioural control (PBC) all of which influence behavioural intention according to TPB. Using 243 questionnaires from management level staff of restaurants, they validated that the constructs of Innovation theory largely influence BI to adopt GPs was found to have the strongest influence on BI while SI had no significant influence this is assumed to be due to little or no pressure from customers whom are very likely to be unaware or uninterested of Green Practices. Kotze et al, (2014) explored the drivers of Green Information Systems (GIS) in South Africa focusing on organizations listed on the stock market. They developed four hypothesis using Butler (2012)'s adaption of Institutional theory. This model included stakeholder influence in Institutional theory. They further added financial pressures as a possible influence for the adoption of GIS. Using quantitative survey, they found that all but one of their hypotheses was supported. The strongest influence for the adoption of GIS was financial pressures. Companies that had stronger financial incentives were more willing to adopt GIS. On the contrary however, organizational perception of GIS had no influence on adoption of GIS. The number of responses largely limited their research; this could have been due to the time of the year the research was conducted. Keui et al (2015) carried out an exploratory study to identify the critical factors that influence the adoption of GSC practices in Chinese firms. They categorized the surveyed firms into three cadres based on their functionalities (upstream, focal and downstream) Combining the work of Lui and Ho (2011) with the United Nations Environmental Protection (2006) recommendations, they developed a

conceptual model comprising of seven hypotheses which they tested using survey from 167 firms. Their study revealed that the three cadres were influenced by different factors. Upstream firms were mostly influenced by compatibility and regulatory factors; downstream firms were influenced by organization and government support: while relative advantage and customer pressures influenced focal firms. All cadres expressed concern about complexity being a barrier to GSC adoption however they all agree that adoption of GSC positively impact on operational and financial performance. Har, Abdul and Nee (2013) proposed a conceptual framework for the perceived drivers of Green Practices Adoption, citing the basic tenets of institutional theory (coercive, mimetic and normative pressures). Taking the hospitality industry and particularly the food and restaurant divisions as a case study they cited possible detrimental impact of non-compliance of the hospitality industry to the adoption of Green Practices. They defined Green Practices from a hospitality perspective stating seven categories as defined by Green Restaurant Association (water efficiency, waster reduction, sustainable furnishing and building materials, sustainable food, energy disposables, chemical pollution). In the conceptualised model, normative pressures are conceived to emanate from employees and managers, coercive pressure are perceived to emanate from regulatory and customer pressures while mimetic pressure are assumed to be as a result of competitor influence. The research is to be carried out in Malaysia where hospitality is considered a huge part of the economy. Roslan, Senin and Soehod (2014) also proposed a conceptual model on the technological drivers of green innovation, drawing on innovation adoption studies, they identified three technological drivers (relative advantage, complexity and compatibility) as

possible drivers of green innovation. They also noted that government influence may not necessarily be a driver however it can moderate the influence of the technological drivers. Perramon et al (2014) explored the motivation for the adoption of GP in the hospitality industry with specific focus on restaurants in Spain. From literature review, they established that while similar research had been previously carried out, there was no evidence of one that showed the impact of GPA on firm performance. They developed six hypotheses within their conceptual model which was tested through a quantitative methodology. Their results showed that environmental pressures were largely responsible for GPA. Similarly, GPA greatly improved operational performance and competitiveness. Competitiveness in turn had a positive impact on firm performance. All these findings are in agreement with previous research in this regard. There was however no direct correlation between GPA and firm performance as well as no positive impact of operational performance on firm performance and these were contrary to previous findings. Their research had implications for academics having verified previous finding as well as showed disparity which could be as a result of the industry sector being researched. It also had implications for practice highlighting that sustainability practices can add value to organisations. Molla and Abareshi (2012) examined the motivations for adoption of Green Practices in IT. They began by differentiating the dimensions of green activities in IT namely Green IT which refers to efforts directed towards greening IT such as energy conservation and pollution reduction and IT for Green which covers how IT can be a tool for Eco sustainability. Using motivational theory, they conceptualised the motivational factors as focus (types) referring to economic or socio-political and locus (source) which could be internal (eco-efficiency and

eco-effectiveness) or external (eco-responsiveness and eco-legitimacy). All these factors were presented on a grid. Using quantitative survey method, they collected data that showed that the source of motivations for Green practices in IT is largely internal however the focus is both economic and social-political. Lin and Ho (2011) examined the determinant of GPA in Chinese logistic firms. They considered GPA as an innovation adoption process due to the fact that it requires the acceptance and implementation of new process and equipment. They examined GPA from three dimension namely Technological, Environmental and Organisational. Using quantitative survey methodology, they discovered that technological factors have a significant influence on GPA in comparison to Organisation and Environmental factors. They found no significant correlation between customer pressures and GPA contrary to several previous studies in environmental management proving their argument that different industries may react differently to GPA an opinion that had been previously expressed by Etzion (2007). Nicholls and Kang (2012) studied familiarity perceived benefits of adoption and extent of implementation of Green initiatives in the hospitality industry with specific emphasis on the hotel/accommodation sector. They made use of quantitative survey to carry out their study based property characteristics (types, ownership, location, size). Their findings showed reasonable correlation between familiarity and type, location and size. They found that corporately owned hotels which are reasonably larger than privately owned ones were more likely to be aware of green initiatives. It was also found that the more aware ones were situated in urban/suburban areas. Similar results were obtained for perceived benefits of adoption. The results for implementation slightly varied with well-established organisations being more likely to adopt



generic green initiatives and local organisations tending to adopt initiatives that resonate with their immediate environment. Del Brio and Junquera (2003) presented a summary of some factors that influence green innovation management in SMEs these include capacity to innovate, financial resources, style of management, human resources, manufacturing activity, technological approach, and cooperation with external stakeholders. Rothenberg and Zyglidopoulos (2007), conducted a study on the printing industry. The findings showed that the adoption of green innovations was mostly a function of the demands of the external of the environment of the organisation. Henriques and Sadorsky (2007) carried out a research on the manufacturing companies in Canada and found that external stakeholder pressure and total quality management increased the likelihood of Canadian companies to innovate on technical issues.

## **2.8 GREEN SHIPPING PRACTICES**

The definition of GSPs is still maturing. GSPs has been considered as technological efforts made by shipping firms that focus on efficiency in energy consumption hence minimizing waste and negative impact on environment (Krozer et al., 2003). It has also been considered as business practices that improve environmental performance of shipping firms which are sometimes demanded by stakeholders e.g. obtaining ISO 14000 certification (in compliance with the ISM Code) (Celik, 2009). (Lai et al, 2011) simply defined GSPs as the “sustainable handling and distribution” of cargoes and although there are seemingly diverging perspectives to GSPs there is convergence in the fact that

they are helpful for minimizing negative environmental impacts that result from shipping activities.

Lai et al, (2011) pioneered studies on GSPs, building on previous studies in environmental management (Lai et al., 2010a; Zhu et al., 2008), they conceptualized GSPs identifying six dimensions in which GSPs can be effectively illustrated. These six dimensions are as follows:

1. Company policy and procedure (CPP)—this embodies organizational/corporate commitment to a vision. It encapsulates the organizational culture of sustainability in a shipping firm, e.g. senior management's commitment/support for sustainability practices. Some shipping firms are already incorporating these and it is obvious in their mission statement e.g. Maersk's environmental policy is “we will honour environmental commitments by minimizing the environmental impact of our business through constant care (i.e., careful use of resources, optimization of operations and handling of waste streams), and striving continuously for improvement in our environmental performance and pollution prevention across all our activities” (Maersk, 2017).
2. Shipping documentation (SD)—this involves documentations concerned with shipping activities e.g. booking request, booking confirmation, shipping instructions, invoice etc. (Wong et al., 2009c). Maersk has tried to reduce the use of paper through the development of an automated “End-to-End EDI Solutions”. This has helped to simplify and synchronize data distribution across all processes and all stakeholders.

3. Shipping equipment (SE)—this involve the incorporation of environmentally friendly shipping equipment and facilities. Some existing examples of these include eco-labelling of resources like shipping crates and totes for reuse. Maersk has replaced using CFC in refrigerated containers with more environmentally friendly refrigerants as well as the use of reusable bamboo wood in the flooring of containers.
4. Shipper cooperation (SC)— the cooperation of shipping firms with other industry stakeholders over environmental issues is another identified dimension of GSPs. This cooperation is necessary to ensure an all-inclusive process view in ensuring environmental suitability.
5. Shipping materials (SM)—this is concerned with management of used shipping material in such a way that it is recycled in an environmentally friendly manner e.g. Maersk's vessel recycling company policy requires a vessel to be rigorously checked before it is delivered to a recycling yard. The procedure ensures that hazardous materials with negative environmental impacts are removed before vessel recycling. On the other hand, new vessels are designed and built to ensure a very high recycling ratio (Lai et al, 2011).
6. Shipping design and compliance (SDC)—this is concerned with taking measures to minimize the life-cycle environmental damage of shipping activities through compliance with regulatory requirements. It covers all design aspect of shipping that ensures environmental sustainability. Maersk being very concerned with fuel consumption has developed the Voyage Efficiency System (VES) to help with fuel-efficient vessel routing (Lai et al, 2011).

They presume that the effective adoption of GSPs would have to encompass these dimensions. This conceptualization however requires empirical validation, which is a part this research's contribution. This research aims to provide empirical validation to Lai et al's conceptualization as well as study/explore case studies to understand what factors motivate the adoption of green shipping practice.

As previously stated in the introduction, this research begins its exploration from an organizational perspective proposing organizational theory as a possible explanation for the adoption of GSPs. We therefore provide a background on Organizational theory. Sarkis et al, (2010) attempting to define Organizational theory stated that it is not easily definable. This is because it has been influenced by several other disciplines (sociology, political science, engineering etc.) (Hatch, 2006; Pfeffer, 1997). They however still managed to put forward the following definition: "management insight that can help explain or describe organizational behaviours, designs, or structures". Management studies as a whole has greatly benefitted from application of Organizational theory (Etzion, 2007; Hoffman and Ventresca, 2002) however application in environmental management is still in early stages (Sarkis et al, 2010).

Studies show that the application of organizational theory to operations management is only beginning to be rampant (Ketchen and Hult, 2007). This research taking a cue from Lai et al (2011) begins its exploration of the adoption of GSPs from an Organizational theory (Institutional theory) perspective. This is because GSPs is just emanating hence a holistic view will be helpful to develop a

generic understating of the subject area. This opinion is also upheld by Scott (2003) who stated, "Institutional perspective provides a useful theoretical lens to study the organizational response to environmental issues" (Scott, 2003) because it sheds light on forces beyond organization that compel organizations to respond to its interest. There is evidence of the application of Institutional Theory to environmental management practices (SCM, IT etc.) and it has proven to be helpful.

Institutional theory is one of the profound organizational theories, which studies the influence of internal/external pressures on an organization. It is valuable for understanding how organizations attend to green issues (Jennings and Zandbergen, 1995, Campbell 2007; Chen et al. 2008;) and it is becoming increasingly relevant in explaining organizational perspectives to environmental management practices (Lounsbury, 1997). Institution theory assumes that the existence and functionality of organizations is embedded in social networks (Lin and Sheu, 2012) hence firm behaviour is largely influenced by its social interaction, which is also a function of interrelated organizational networks (Anderson et al. 1994; Iacobucci and Hopkins 1992; Meyer and Rowan, 1977; Scott, 1987). Institutional theory tries to explain the reason for observed similarities amongst firms in a specific field (DiMaggio & Powell, 1983). According to institutional theory, institutions are "regulative, normative, and cognitive structures and activities that provide stability and meaning for social behaviour" and they are a vital part of an environment (Scott, 1995, p. 33). It is observed that institutions exert a constraining force (isomorphism) on organizations, which cause organizations in a specific class to act in a similar

pattern as other under the same type of influence (Hawley, 1968). According to (DiMaggio & Powell, 1983), three types of Isomorphic influences are identified. These are coercive, normative, and mimetic. Coercive isomorphism translates to pressures from entities upon which firms/organizations depend for resources. Mimetic isomorphism arises as a result of firms/organizations imitating or copying other successful ones. This happens when firms are in uncertain situations. Normative isomorphism is as a result of firms having to follow standards and/or practices as established by certified organizations (certification and training methods, professional networks etc.,).

In Supply Chain Management, Institutional theory has been used to study the adoption of Green Practices and impressive findings have been made showing the effect is coercive pressures ((Rivera, 2004), (Clemens and Douglas, 2006), (Kilbourne et al., 2002)), normative pressures from customers and the market in general (Carter et al., (2000), Ball and Craig (2010), Harris, (2006), Christmann and Taylor, 2001) and mimetic pressures (Aerts et al., (2006), Zhu and Liu, (2010), Christmann and Taylor, (2001)). There are similar studies in Information Technology & Information System (Orlikowski et al. 2001, Tingling et al. 2002, Teo et al. 2003, Liang et al. 2007). (Murugesan 2008) emphasized the legal, ethical and social obligation we have to green our IT processes. (Adela et al. 2009) found that coercive and mimetic forces played important roles in IT and IS adoption. The influence of normative pressure was omitted in their model because they could not differentiate between its effects and mimetic effects. (Chen et al. 2010) cited (Lampe et al. 1991) to have suggested that a combination

of pragmatic (e.g. financial and legal) and idealistic (e.g. moral and ethical) are mostly responsible for firms' adoption of Green IT.

Institutional theory is taken as a guide into exploring factors influencing adoption of green practices in shipping and based on this a proposition of adoption is presented in subsequent sections. This research does not emphatically posit Institutional theory as responsible for the adoption of GSPs; it however takes it as a starting point in exploring the adoption of GSP. This research adopts an exploratory/explanatory case study (qualitative) approach, which allows for the introduction of a theory even though it is interpretivism perspective. More on this is discussed in the methodology section.

## **2.9 THEORETICAL PERSPECTIVES IN ENVIRONMENTAL STUDIES**

Organizational theory is in the early phases of broad introduction and applications into operations management and the SCM literature (Ketchen and Hult, 2007). This section presents four possible theories than will be examined considering this research quest. All four theories have been identified based on their robust application and relevance to operations management particularly environmental/green practice issues.

### **2.9.1 INSTITUTIONAL THEORY AND ENVIRONMENTAL PRACTICES.**

Institution theory assumes that existence and functionality of organizations is embedded in social networks (Lin and Sheu, 2012) hence firm behaviour is largely influenced by its social interaction, which is also a function of interrelated organizational networks (Anderson et al. 1994; Iacobucci and Hopkins 1992; Meyer and Rowan, 1977; Scott, 1987). Institutional theory tries to explain the

reason for observed similarities amongst firms in a specific field (DiMaggio & Powell, 1983). The emphasis of institutional theory is that efficiency and effectiveness don't necessarily determine the stability/success of organizational structures and processes. These structures and processes somewhat acquire meaning and stability in their own right (Lincoln, 1995). The earlier stages of organizational life cycle show a variety in organizational forms. This however quickly gives way to synchronized organizational structures and practices. According to institutional theory, institutions are "regulative, normative, and cognitive structures and activities that provide stability and meaning for social behaviour" (Scott, 1995, p. 33) and they are a vital part of an organisation's environment. Examples include regulations, customs, industrial norms, culture, ethic, laws etc. It is observed that institutions exert a constraining force on organizations. This constraining force is called "isomorphism" and its influence cause organizations in a specific class to act in a similar pattern as other under the same type of influence (Hawley, 1968). According to (DiMaggio and Powell, 1983), three types of Isomorphic influences are identified. These are coercive, normative, and mimetic. Coercive isomorphism translates to pressures from entities upon which firms/organizations depend for resources. Mimetic isomorphism arises as a result of firms/organizations imitating or copying other successful ones. This happens when firms are in uncertain situations. Normative isomorphism is a result of firms having to follow standards and/or practices as established by certified organizations (certification and training methods, professional networks etc.). (Aldrich & Fiol, 1994) identified that new organizational forms come to be based on societal perception of them as legitimate instead of based on availability of untapped resources. Legitimacy in



this regard is the societal perception, acceptance and approval of firm's actions by both internal and external stakeholders (Kostova, Roth, & Dacin, 2008) as well as the consistency of these actions with widely accepted norms rules and beliefs (Sonpar, Pazzaglia, & Kornijenko, 2009). Firms submitting and conforming to institutional pressures and social norms further grounds this legitimacy as well as increases their tendency of survival (Oliver, 1997; Yang & Konrad, 2010). This happens through certain institutional activities, which occurs at three levels: individual, organizational, and interorganizational (Oliver, 1997). On these levels, institutional pressures occur in different dimensions. At the top most level (interorganizational level) pressures are from the government, industry alliances etc. At the organizational level, social, cultural and political influences make organizations look and act similar to each other (DiMaggio & Powell, 1983). At the lowest level (individual level) managers are influenced by habits, traditions and norms of colleagues both consciously and unconsciously (Berger & Luckmann, 1967) all of which contribute to the eventual appearance of the organization. Institutionalization becomes apparent when an action is done merely because it has always been done that way and not necessarily because it is beneficial. It is argued that many organisational decisions/actions are in this manner and nobody bothers to questions their authenticity (Oliver, 1997). One profound aspect of institutional theory that has been largely misinterpreted is the "iron cage" paper (DiMaggio and Powell, 1983) in which they argue, "Organizations become isomorphic within their institutional environments". Some misinterpretations of this paper are that "organizations become isomorphic with each other, so over time, all become identical to each other"; another is that "organizations are only passive to the

elements and forces in their environments” (Suddaby, 2010). DiMaggio, (1988) has however, attempted to correct this errors stating that “organizations are not prisoners of their environmental forces”. He further emphasized that organization sometimes act as change agents in a creative pattern through a process he described as “institutional entrepreneurship.” It is further said that “Institutional entrepreneurs” (which could be individuals, groups, organizations, or groups of organizations) have the ability to create new organizations as well as transform old ones (DiMaggio, 1988; Garud, Hardy, & Maguire, 2007). If this must happen however, they must both initiate and implement divergent changes (Battilana, Leca, & Boxenbaum, 2009). This theoretical modification has directed institutional theorist into investigating how organizations become change agents. An example of this is the work of (Oliver 1991) who investigated how organizations respond to (conform or resist) institutional pressures in ascending order of resistance as follows acquiescence, compromise, avoidance, defiance, or manipulation. Further significant changes ensued in the late 1970s-1980s leading to a migration from the previous classical institutional issues (coalitions, competing values, influence, power etc.,) (Greenwood& Hinings, 1996) to newer issues like examining organizations at field level with proposing for future research into areas like categories, language, work, and aesthetics (Suddaby 2010). This research will examine the data collected considering theory to establish if and how institutional forces drive GSPs adoption and how this may affect organisational performance.

### **2.9.2 COMPLEXITY THEORY AND ENVIRONMENTAL PRACTICES**

Complexity theory suggest that “firms operate in a system that includes both

order and disorder (Prigogine, 1984), where interactions of the involved parties will determine the performance outcomes of the system” (Sarkis et al., 2011). Chakravarty, (1997) highlighted that with respect to organisation complexity on environmental issues it can be explain through diversity or heterogeneity amongst factors that influence organisational decisions (customers, suppliers, government regulations, and technology). It is expected that increasing complexity increases the difficulty with which the organisation is able to plan and predict its actions e.g. the adoption of green practices. This imposes a responsibility on the organisation to be sensitive and responsive to its environment a feat that requires co-evolution and interdependencies to successfully adapt to the evolving changes to its existing system (Crozier and Thoenig, 1976). Adoption of Green practices requires the involvement of several individual parties from within and outside the system i.e. the organisation working together. This poses a great difficulty which can be further increased when other organisational complexities such as size and interrelationships are taken into consideration (Vachon and Klassen, (2006b); Guide and Wassenhove, (2009); Matos and Hall, (2007). Considering that fact that all contributing parties are individual and separate entities, it is almost impossible to accurately predict the any outcomes without knowing the individual contribution of each party and as more factors are considered (environmental, economic, regulatory, social, and political factors) complexities become even more exacerbated (Bai and Sarkis, 2010a). As a complex system expands, there is increased interaction between member entities hence it becomes more difficult to predict behaviours and outcomes of the system (Sarkis et al., 2011). Choi and Krause (2006) identified such increasing complexity due to expanding dynamics of a supply chain system.

In their work, they defined complexity “as how the members of a system (e.g., suppliers in a base) are varied and interact with one another.” The understanding of the complexity of a system helps to manage several relating entities e.g. in supply chain issues related to supply risk, transaction costs, supplier innovation, and supplier responsive- ness (Choi and Krause, 2006). Miao and Xi, (2007) linked the understanding of a system’s complexity to social network theory particularly its implication on GSCM. Shi et al., (2010) also used it in the explanation of management and emergence of eco-industrial parks. Understanding organisational complexity has a profound implication on green practice and other environmentally related implementation as it highlights that certain activities e.g., customer cooperation requires a network of dynamic relationships within the system and can ultimately determine the outcome of the system (Vachon and Klassen, (2006b); Koufteros et al., 2007) and as Yang, (2010) observantly noted “it is the interaction among the involved parties that allows for the sharing of knowledge and creation of meaning.” This can help minimise the many uncertainties that can arise from adoption of Green practices hence enhancing the productivity of the system/organisation. This research through the data collected will examine if complexity theory helps explain the adoption of GSPs. From the data collected elements of complexity theory and accompanying interaction between several individual entities will be examined to see if this drives GSPs adoption as well as impact of organisational performance.

### **2.9.3 RESOURCE BASED VIEW AND ENVIRONMENTAL PRACTICES**

Barney, (1991) put forward the resource based model of competitive advantage suggesting that a firm may gain competitive advantage by “harnessing its

resources that are valuable, rare, imperfectly imitable, and non- substitutable.” Barney, (1991) and Daft, (1983) described firms’ resources as knowledge, information, firm attributes, organizational processes and capabilities, and assets within the organisations’ control that avails it the ability to develop and deploy strategies that help it improve its competitiveness (improve efficiency and effectiveness). There have been extensions of RBV which include the works of Hart, (1995) and Helfat and Peteraf, (2003) whom considered dynamic capability integration and natural resources. Improvements seen in the organisational performance can easily be attributed to development of the organisation’s capabilities and resources Sarkis et al (2011) which could be through green practice adoption as many researchers have shown to have a positive correlation with improved performance. A good example is Vachon and Klassen, (2006b) whose work showed a positive correlation between partnership in green project with customers and improved environmental performance, quality and flexibility. Developments in organisational capability through green practices adoption could further enhance an organisation’s inimitability, rarity, non-substitutability etc. and other aspects RBV (Carter and Carter, (1998); Forstl et al., (2010); Sarkis et al., 2011) hence this could be a factor for GSPs adoption. Additionally, there are arguments for improved organisational reputation and image to which the work of Sarkis, (2009) and Forstl et al., (2010) provide substantial evidence. The arguments for improved competitive advantage as an outcome of improved organisational capabilities may however prove to be selective as Shang et al., (2010) only found this to be true in the downstream sector of GSCM. There are a good number of extension to RBV, Gold et al., (2010) examined competitiveness across supply chains rather

than across organisations. Lai et al., (2010) opined that green knowledge and capability is a resource that falls well within RBV dimensions. Similarly, Sarkis et al., (2011) opined that dynamic capabilities are a part of organisational learning and can help the organisation build its knowledge resources an idea complimented by the works of González et al., (2008); Zhu et al., (2008) and Carter and Rogers, 2008. Other application of RBV is in reverse logistics (Sarkis et al., 2010) the mediating effect of internal organizational resources on external forces (institutional forces) were examined. González- Torre et al., (2010) further identified that implementing environmental/green practices would be difficult if an organisation lacks the necessary capabilities and resources. Sarkis et al., (2011) additionally, opined that such resources as green capabilities a part of which is GPA are rare and may be great sources of competitive advantage to firms which such capabilities. Having examined resourced based model of RBV, it is anticipated that this can explain the adoption of GSPs. The RBV emphasises the availability of certain un-substitutable organisational resources and capabilities which helps it develop and deploy strategies to gain competitive advantage. This research will examine if the case organisations possess any unique resources or capabilities which help it adopt GSPs and how this avails them any competitive advantage.

#### **2.9.4 STAKEHOLDER THEORY AND ENVIRONMENTAL PRACTICES**

Freeman, (1984) defined stakeholders as any “any group or individual who can affect or is affected by the achievement of an organization’s objectives” (Freeman, 1984). Taking the stated definition forward, Stakeholder theory thus

suggest that organisational actions impact in some way on several parties (stakeholders) some of which are within and outside the organisation; this in turn causes the stakeholder to pressurise the organisation into minimising its negative activities and improving its positive ones (Sarkis et al., 2011). There have been several categorisations of stakeholders in literature some of which include direct and indirect, urgency and power, primary and secondary and based on the dimensions of legitimacy (Mitchell et al., (1997); Delmas, (2001, 2002); Delmas and Toffel, (2004)) hence there have been a good number of application of the theory. The fundamental premise however is that entities or groups of people within and outside the organisation can influence organisational decision (Sarkis et al., 2011) which can include adoption of green practices. Some aspects of the Stakeholder theory may overlap with those of institutional theory particularly where norms and legitimacy are discussed (Sarkis et al., 2011) as these are predominantly dependent on group(s) of individuals with specific interest and/or stake in the organisation however there are still distinctions e.g. the presence of competitors' influence which can influence organisations' decisions but not necessarily by pressurising the organisation; furthermore, while competitors can be affected by an organisations decisions and vice versa, neither have a stake (hold) on the other. When environmental issues e.g. green practices are taken into consideration, there could be a vast array of stakeholders even more so as would usually be found with individual organisations (de Brito et al., 2008). The analysis of stakeholder influence on an organisation's green decisions are quite important as there exists the possibility of pressures from stakeholders on organisations to adopt/implement green practices which the organisation may not particularly

perceive to translate into competitive advantage (Sarkis et al., 2011) although there is reasonable evidence to suggest the green practice does improve organisation performance. There are a good number of application of stakeholder theory to green practices e.g. green purchasing (Bjorklund, in press; Maignan and McAlister, 2003); reverse logistics (Sarkis et al., 2010); green logistics, Supply chain life cycle analysis and Green Supply chain (Matos and Hall, (2007); Zhu et al., (2008); Chien and Shih, (2007); Gonza'lez-Benito and Gonza'lez-Benito, (2006)). Furthermore, the roles of different stakeholders within green practices have also been investigated (Gunther and Scheibe, (2005); de Brito et al., (2008)) as well as the multi-theoretic/general explanatory application of this theory on specific green issues (Sarkis et al., 2010; Tate et al., 2010). This research anticipates the possibility of this theory in the explanation of green shipping practice adoption. The research will try to identify the different stakeholders within the shipping industry and how their influence may be driving firms to adopt green shipping practices will be examined from the data collected furthermore, the impact of this decision (adoption) will be examined.

## **2.10 RELATIONSHIP BETWEEN ENVIRONMENTAL PERFORMANCE AND FIRM PERFORMANCE**

There is some evidence of relationship between environmental and firm performance in literature. It started as a conceptual idea however it has gradually progressed into empirically proven facts over time mostly in the manufacturing sector. (Porter, 1991) was one of the first to conceptualize this idea using the terminology "win-win", which at the time challenged the traditional mind-set that environmental regulations are a burden to the health of



organizations; Porter's arguments were based on observatory evidence, which suggested that there exists benefits for environmental practices implemented by firms and these benefits outweigh the cost of implementing these practices hence stricter regulations are likely to inspire innovation which will eventually translate into improved firm performance. This notion was carried forward by (Porter and van der Linde 1995a) through the idea of "innovation offsets". The limitation to their works was that their studies only took into account environmental regulatory influence, which is only one dimension of influences/pressures that organizations are subjected to. Several researches show that there is a positive correlation between environmental practices and organisational performance as will be seen below. Perramon et al, 2014 highlighted that this relationship can be in form of operations improvement, cost savings, competitive advantage, reputation etc. There has been further works in this regard with the contribution of other authors who have considered the influence of broader factors. Berry and Rondinelli (1998) strongly emphasized the immense value of firms' internal environmental strategies and its effects on firm performance stating lowered regulatory cost and new business opportunities as benefits of environmental proactivity. Hanna and Newman (1995) also corroborated the "win-win" point of view and similar arguments were also put forward by ((Royston, 1980), (Bonifant, 1994), (Bonifant and Ratcliffe, 1994)) albeit without empirical proof. Florida (1996) provided empirical validations that supported Porter's "win-win" arguments using surveys in the manufacturing sector. Similar findings were made by (Klassen and McLaughlin (1996), Russo and Fouts, (1997), Klassen and Whybark, (1999) and Orlitzky et al. (2003). Additionally, the works of Melnyk et al. (2003) and Zhu

and Sarkis (2004) through surveys further highlight the positive correlation between environmental management implementation and improved performance both environmentally and operationally. In another instance, Montabon et al. (2007) made use of corporate environmental reports in their analyses and found that similar relation exists between environmental practices and operational performance. On the contrary however Jacobs et al. (2010), obtained inconclusive results in their study however they conducted their research using data collected from daily business press.

The literature presented above all show that relationship exist between environmental and firm performance. Empirical evidence exists for this relationship in the manufacturing sector. The influence of external (e.g. regulatory, customer etc.) and internal (managerial) pressures has also been considered. This research will look to find if similar relationship exists in the shipping sector by exploring the drivers of GSPs and the impact on organisational performance.

## **2.11 PROSPECTS FOR SUSTAINABILITY IN MARITIME SHIPPING**

The prospects of sustainability in maritime has been furthered strengthened through several academic works. Much of the work has been done in the area of emission reduction. There appears to be a consensus in academia about the prospects of maritime emission reduction. Psaraftis and Kontovas (2009b) investigated a fleet of identical ships, the conclusion of their analysis revealed that total emissions can be reduced through speed reduction, although this might require the addition of more vessels to the fleet. In contrast to their previous results however, their works also showed that speed reduction in Sulphur

Emissions Controlled Area (SECA) is not beneficial for total emission reduction because corresponding speed increase follows outside of these areas leading to overall emissions increase. Similar conclusions were made in their other works (Psaraftis & Kontovas (2010) and Kontovas & Psaraftis (2011)). Faber, et al., (2010) estimated that emissions of bulkers, tankers and container vessels could be reduced by up to 30% in the coming years. Cariou (2011) investigated slow steaming strategies in container shipping measuring the reduction of CO<sub>2</sub> achieved in various container trades. Linstad, et al., (2011) presented an analysis (at the strategic level) on the impact of lower speeds on the cost and emissions of the world fleet; they conclude that there is potential for emission reduction through the imposition of speed limits. In a separate attempt, Corbett, et al., (2009), developed equations relating speed, energy consumption, and total cost to evaluate the impact of speed reduction on emissions. Du, et al., (2011) considered emission reduction prospects through fuel consumption minimization in the context of a berth allocation problem. Wang, et al., (2013) later improved on this work. Fagerholt, et al., (2010), considered a single route speed optimization problem within a time window and proposed a solution methodology in which the arrival times are discretized and the solution is based on the shortest path of the directed acyclic graph that is formed. Their results showed significant reductions in ship emissions. This was also true in the works of Qi & Song, (2012) who investigated the problem of designing an optimal vessel schedule in the liner-shipping route to minimize the total expected fuel consumption (hence emissions) considering uncertain port times and frequency requirements on the liner schedule. Gnokis & Psaraftis (2012) developed a series of models to optimize speed in both the laden and ballast legs for several tanker

vessels in varying scenarios; their work considered the prospect of emission reduction through estimating the impact of inventory cost on emission as well as other factors. Eefsen & Cerup-Simonsen (2010) examined the trade-offs between lower fuel costs and higher inventory costs associated with speed reduction, as well as their impact on emissions. Lastly, Cariou & Cheaitou (2012) investigated policy options for maritime emission reduction within the European Commission. They compared possible outcomes of proposed imposition of speed limits versus bunker levy. They concluded that the latter measure is counterproductive for two reasons (i) it may ultimately generate more emissions and incur a cost per tonne of CO<sub>2</sub> which is more than society is willing to pay; (ii) it is sub-optimal compared to results obtained if an international bunker-levy were to be implemented.

## **2.12 LITERATURE AND RESEARCH GAP**

The studies cited above employed different theories in their quest, for instance Chou, Chen and Wang (2012) combined Innovation Adoption Theory and Theory of Planned Behaviour to examine the behavioural intention (BI) to implement GPs. A good number of them also made use of institutional theory (Evangelista P, (2014), Hoejmosse et al, (2014), Zhu et al (2007, 2008a, 2008b), Chou, Chen and Wang (2012), Kotze et al, (2014), Har, Abdul and Nee (2013) and Roslan, Senin and Soehod (2014). In some cases, Innovation theory was combined with another framework as in the case of Keui et al (2015) and Lin and Ho (2011). It is not surprising that institutional theory is being widely used in GPA studies, organisational theories have been said to contribute significantly to general management studies (Etzion, 2007; Hoffman and Ventresca, 2002). However, Ketchen and Hult (2007) stated that organisational theory is only beginning to

find useful application operations management an opinion that Sarkis et al, (2010) also expressed about environmental management literature. This research follows followed the conceptualisation of Lai et al, (2011) with the aim of providing empirical validation. This research examined four theoretical perspective to identify what theory substantially explains GSPs adoption. These four theories are Resource based view, Complexity theory, stakeholder theory and Institutional theory.

Complexity theory suggest that “firms operate in a system that includes both order and disorder (Prigogine, 1984), where interactions of the involved parties will determine the performance outcomes of the system” (Sarkis et al., 2011). Evidence of application of this theory to environmental issues has been presented in the literature review chapter (Choi and Krause (2006); Shi et al, (2010); Vachon and Klassen, (2006b); Koufteros et al., 2007); Yang, (2010)). The evidence in this research did not appear to suggest the influence of diversity or heterogeneity of the identified factors hence complexity theory does not suffice as a plausible theory for the explanation of GSPs adoption.

DiMaggio and Powell, (1983) introduced institutional theory describing organisations as institutions that behave in a certain way in response to certain institutional forces/influences. They identified three institutional influences/forces; coercive influence, mimetic influence and normative influences. Evidence of previous application of institutional theory to environmental studies include; Customer influence and Regulatory influence are typically coercive influences as several researches have also identified (Evangelista (2014); Hoejmose et al, (2014); Keui et al (2015), Har, Abdul and

Nee (2013); Etzion (2017); Chou, Chen and Wang (2012); Lin and Ho (2011)). Professionalism and Leadership and Managerial support are usually normative influence (Tate et al (2010); Zhu and Sarkis (2007); Lin and Ho (2011); Carter et al., (2000); Ball and Craig (2010); Harris, (2006); Christmann and Taylor, (2001)) while the influence of Competitors are considered Mimetic (Christmann and Taylor, 2001); Zhu and Liu, (2010); Zhu et al (2007); Aerts et al., (2006)). Having discussed institutional theory considering the factors identified to influence GSPs adoption, this research concluded that it substantially explains the adoption of GSPs being accountable for five of the factors identified. Morals convictions/value has been identified as an additional factor influencing the adoption of GSPs and since this is the first time that this factors has been identified, it is proposed here as an extension of institutional theory as will be seen in the conceptual framework in chapter five.

Barney, (1991) put forward the Resource based Model which suggests that a firm may gain competitive advantage by “harnessing its resources that are valuable, rare, imperfectly imitable, and non- substitutable” (Barney, 1991). The works of Barney, (1991) and Daft, (1983) help understand firms’ resources to be knowledge, information, firm attributes, organizational processes and capabilities, and assets within the organisations’ control that avails it the ability to develop and deploy strategies that help it improve its competitiveness (improve efficiency and effectiveness). Evidence of application of RBV in environmental management have been discussed in the literature review section (Carter and Carter, (1998); Vachon and Klassen, (2006b); Forstl et al., (2010); Sarkis et al., (2011)). The evidence obtained from the data collected identified six

factors as responsible for GSPs adoption. RBV only accounts for three of these factors which also appear to only have a supporting/enhancing role in GSPs adoption. Taking this into considering, it cannot be concluded that RBV sufficiently explains GSP adoption.

Stakeholder theory also examined as a plausible theory sufficient to explain GSPs adoption. This theory is examined considering the factors identified to be responsible for GSP adoption. Freeman, (1984) defined stakeholders as “any group or individual who can affect or is affected by the achievement of an organization’s objectives”. Evidence of application of Stakeholder theory to environmental practices have been discussed in the literature review section (green purchasing (Bjorklund, in press; Maignan and McAlister, 2003); reverse logistics (Sarkis et al., 2010); green logistics, Supply chain life cycle analysis and Green Supply chain (Matos and Hall, (2007); Zhu et al., (2008); Chien and Shih, (2007); Gonza’lez-Benito and Gonza’lez-Benito, (2006)) (de Brito et al., 2008) (Sarkis et al., 2011)). Stakeholder theory reasonably accounts for four of the six factors identified to drive GSPs adoption. It does not however account for the influence of competitors and moral convictions and since this is the first-time moral convictions and values have been identified to influence GPA it cannot be considered and extension of Stakeholder theory hence it is concluded that Stakeholder theory substantially explains GSPs adoption. This research through qualitative examination of these four theories suggest institutional theory as a good explanation for GSPs adoption presenting unfound results in green shipping literature.

## 2.13 THEORETICAL FRAMEWORK FOR THE ADOPTION OF GREEN SHIPPING PRACTICES AND IMPACT ON ORGANISATIONAL PERFORMANCE

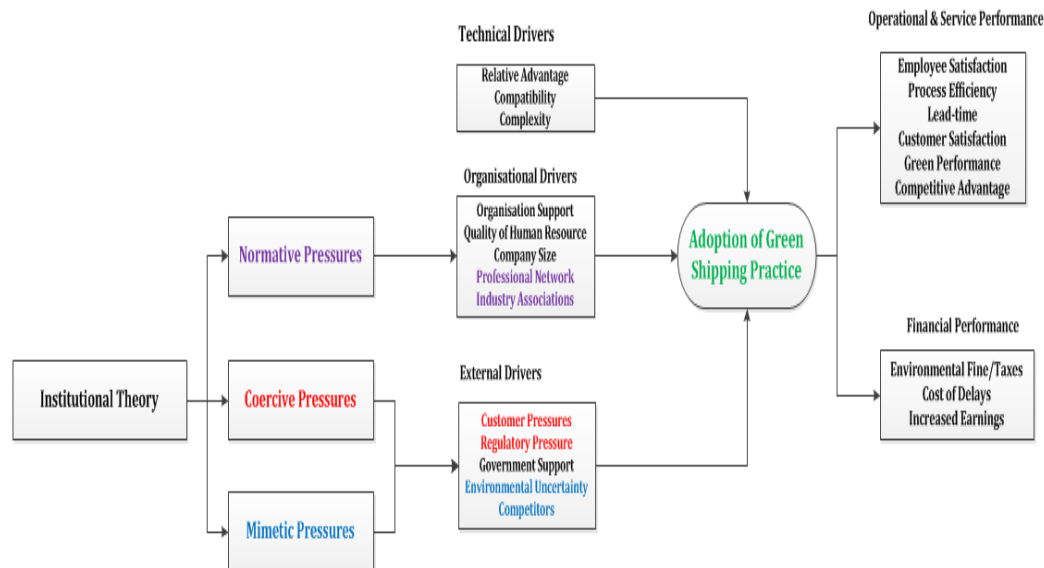


Figure 2.7 Conceptual propositions for the adoption of Green Shipping Practices and Impact on Organisational performance (Personal collection)

### COERCIVE ISOMORPHISM (REGULATORY FORCES) CAN STRONGLY INFLUENCE THE ADOPTION OF GSPS

Environmental regulations are systematic guidelines that help firms implement environmentally responsible practices. This has been observed to be effective from previous environmental studies that have highlighted the importance of regulations in environmental management (Lai et al, 2011). The enforcement of these regulations imposes “coercive isomorphism” on organizations. A profound regulatory body in shipping is the IMO, which oversees all maritime regulatory activities all over the world. Recently, IMO modified (MARPOL 73/78) protocol of 1978 to include all forms of maritime environmental pollutions (accidental, chemical, packaging, sewage, air etc.). It has been previously argued that sloppy



regulatory enforcements negatively affect firm's implementations (Economy and Lieberthal, 2007). Hence to reap the benefit of regulations, it must be firmly enforced. It is presumed that coercive isomorphism will influence the adoption of GSPs amongst shipping firms. This is however only an assumption that requires empirical validation as noted by (Lai et al, 2011). In addition to this, it is necessary to know the extent of its influence (absolute or partial).

### **MIMETIC ISOMORPHISM (INDUSTRY INSTITUTIONALIZED PRACTICES)**

#### **CAN STRONGLY INFLUENCE THE ADOPTION OF GSPS**

Industry instituted norms/practices often play a profound role in ensuring its own sustainability. This is obvious through efforts of industrial associations. A good example is the Marine Environmental Protection Committee (MEPC), which has often encouraged the implementation of environmentally sustainable practices in shipping. Recently, MEPC proposed for the reduction of carbon footprint of the shipping industry through a program that ensured environmental friendly recycling of vessels at the end of its service life. Maersk Line has already adopted this proposition and being a leader in the shipping business, this can influence other shipping firms to follow suit in a bid to achieve some form of legitimacy as well as measure up to stand a good competing chance. Similarly, the shipping and environmental code of practice as proposed by International Chamber of Shipping suggests ten environmentally friendly practices to encourage sustainability in shipping (ICS, 2010). This form of influence is presumed to contribute to the adoption of GSPs as shipping firms can be motivated to adopt GSP due to benefits that can be gained from assistance

offered by these organizations. An empirical verification of this type influence is required.

### **NORMATIVE ISOMORPHISM (STAKEHOLDER INFLUENCES) CAN STRONGLY INFLUENCE THE ADOPTION OF GSPS**

Pressure from stakeholders upon which shipping firms largely depend for the business needs is another factor likely to influence the adoption of GSPs by shipping firms. This pressure is interpreted as normative Isomorphism as shown on the conceptual model above. This pressure is due to increasing awareness of about environmental sustainability. Staffs of shipping firms in a bid to measure up to their professional colleagues and hence attain legitimacy are likely to trigger their organisations to adopt environmental friendly practices in these GSPs. This research will examine if this plays a role in the adoption of GSPs and to what extent.

### **ADOPTION OF GSPS LEADS TO INCREASED FIRM (FINANCIAL AND SERVICE) PERFORMANCE**

(Lin and Sheu, 2012) clearly pointed out that there is a profound difference between firms submitting to pressures in the adoption of green practices and the exploitation of these practices for the improvement of firm performance. Some research (e.g., Anderson et al., 1999; Ketokivi and Schroeder, 2004; Prajogo, 2011) also suggests that intent to implement certain management practices (e.g. TQM and ISO9000) could influence the effectiveness of those practices and the overall performance of the firm. Similarly, (Choi and Eboch, 1998; Prajogo, 2011;

Zhu and Sarkis, 2007) examining the influence of internal and external pressures in Green Supply Chain Management found that that “existence and response to internal motives and external pressures are likely to cause the relationships between green practices and performance to vary”. Could this finding be true for the shipping industry? Striking a good balance between these two functions is usually a challenge for organizations (Lai et al., 2008, 2006, 2010b). The influence of the institutional forces mentioned above will need to be appropriately balanced for shipping firm to reap economic gains. This is the striking advantage of GSPs over other environmental management practices in that it strives to create a balance between the reduction of adverse environmental activities and performance gains for shipping firms. This not only increases profitability but also enhances compliance with international regulatory trade requirements hence increasing possibility of business expansion (Lai et al, 2011). GSPs consciously incorporate environmentally friendly practices into the end-to-end process of cargo transportation. This is reflected in decision making at every stage of process. There is some evidence that adoption of environmentally friendly practices can enhance organizational/firm performance (Lai et al., 2010a). (Vachon and Klassen, 2008; Yang et al., 2009b; Zhu et al., 2010) all suggest that some organizations reaped positive performance benefits through the cooperation of suppliers and customers on environmentally related issues. All these assumptions however lack empirical validation particularly in the shipping industry, which is only beginning to adopt green, practices hence this research is interested finding out what influence/contribution does the adoption of GSPs have on firm performance.

## **2.14 CONCLUSION**

This research seeks to investigate what factors exert the most influence on shipping firms to adopt GSPs. Considering that businesses exist for profit; there is a need to balance profitability and sustainability hence, this research also looks at the influence of these factors on firm performance. It is anticipated that understanding these influences and their impacts will be helpful in practice for the further development sustainability strategies while increasing academic knowledge in maritime and management studies. Four possible theories have been examined in this research quest. All four theories have been identified based on their robust application and relevance to operations management particularly environmental/green practice issues. Additionally, the literature has shown that relationship exist between environmental and firm performance. Empirical evidence exists for this relationship in the manufacturing sector. The influence of external (e.g. regulatory, customer etc.) and internal (managerial) pressures has also been considered. This research will look to find if similar relationship exists in the shipping sector by exploring the drivers of GSPs and the impact on organisational performance. Finally, the chapter presents valuable evidence that literatures support the tendency for maritime sustainability through maritime emission reduction. Much of this work is theoretical; the adoption of GSPs is a practical response by the shipping industry to ensure maritime sustainability. This response is still slow and the factors GSP adoption is very vague. This research seeks to investigate what factors exert the most influence on shipping firms to adopt GSPs. Considering that businesses exist for profit; there is a need to balance profitability and sustainability hence, this

research also looks at the influence of these factors on firm performance. It is anticipated that understanding these influences and their impacts will be helpful in practice for the further development sustainability strategies while increasing academic knowledge in maritime and management studies.

### **3. METHODOLOGY**

#### **3.1 INTRODUCTION**

This section discusses the methodical approach of this research. It briefly describes the existing research paradigms with emphasis on the paradigm considered for his research. This research takes a case study approach due to the current early stages of the subject area. Several authors (Mintzberg, (1979); Bonoma, (1985), Benbasat et al., (1987); Eisenhardt, (1989); McCutcheon and Meredith, (1993); Larsson (1993); Stuart et al. (2002); Voss et al. (2002); Dul and Hak (2008)) have justified the use of case studies as a viable research approach particularly when the research area is complex/broad, suffers from a dearth of literature/theory or when the context is of great importance all of which this research has an element. The use of this approach is further justified because case studies are used to explore single phenomenon, which in this case is the adoption of GSPs. Other requirements of the use of case study are also satisfied by the research idea as will be seen in subsequent sections making the approach legitimate.

Typically, there are two extreme research paradigms, positivism and interpretivism. These two are based on two contrasting opinions on worldview and hence the approach to undertaking research. Positivism emanates from natural sciences and hence upholds a deductive approach to research emphasizing the use of theories to explain/understand social phenomena (Collis and Hussey, 2009, p 56). On the other hand, interpretivism developed because of the inadequacy of natural science perspective explanation of social phenomena. It focuses on subjectively exploring social phenomena with a view to understand

its complexity without the necessary constraints of beginning with a theory as positivism recommends (Collis and Hussey, 2009, p 57). Due to the varying perspective of these paradigms, they require different analytical methods. Positivism, which is mostly associated with large data, requires surveys, cross sectional studies, experimental studies etc. Interpretivism goes along with methodologies such as case studies, ethnography, action research etc.

This research takes an interpretivism position and specifically adopts a case study approach (exploratory/explanatory case study). Case studies are used to explore phenomena in their natural setting and there are different types. Exploratory case studies are particularly used when there are few theories applicable or where a deficiency in body of knowledge exists, which characterizes this research. In addition, an element of Explanatory case study is included in which it is permitted to have an underlying theory for the development of foundational understanding of the research area (Collis and Hussey, 2009, p 82). The subject area being explored is very new and lacks a systematic theoretical framework and literature. Hussey (2009) further suggests that the different types of case studies are much differentiated hence one type can be combined with another.

### **3.2 CHOOSING AN APPROPRIATE RESEARCH APPROACH**

Selecting an appropriate research approach is a critical part of research design Walsham (1995) and it can be even more daunting when the research area intersects between several disciplines (Cavaye, 1996) hence great attention must be paid to methodology selection (Galliers, 1994). As it has been established in

previous sections, the adoption of GSPs is a new concept hence there is both a dearth of literature as well as no established research approach. Hence in selecting the appropriate research approach, it is not just enough to select the pros and cons of existing methodologies as noted Galliers (1985), there is a need for a proper understanding of the research environment. The following sections guide us into the existing philosophical basics of research.

### **3.2.1 EPISTEMOLOGY: PHILOSOPHICAL UNDERPINNINGS**

In developing a good research approach, it is necessary to show adequate understanding of the various philosophical approaches. This is helpful for justification of the selected methodology. According to Guba and Lincoln (1994) there are four paradigms for qualitative research; positivism (the scientific method), critical theory, post-positivism and constructivism (interpretivism) and whatever the prevailing/selected research philosophy about a topic is, it will ultimately chart the course of how the research will be designed, which also encompasses data gathering/collection, analysis and interpretation. The striking difference between epistemology and doxology is that while the latter assumes/accepts a certain truth, the former seeks to understand how things are known to be true. This is essentially the crux of scientific research methods and an opinion that is also strongly shared by interpretivism; it strives to move us towards an understanding of the truth (epistemology) of a subject matter rather than a mere acceptance of what appears to be true and this is achieved through the testing of hypotheses (Galliers, 1991).

A very contentious aspect of philosophy of science is to what extent a research



approach can reveal the truth. Empiricists argue that well-designed enquiry will adequately reveal reality. There is however a slightly opposing notion that each enquiry only increases our knowledge of an “approximate truth” (Psillos, 1999). Going on further, modernist usually distinct between the subject of enquiry and the process of enquiry. The core assumption here is that the subject of enquiry exists on its own, has its own unique identity and reality (if only it can be identified) and this is separate from the subjective process which determines the manner of interpretation which shows the background and assumptions of the research (Bem and Looren de Jong, 2006). Finally, there are also post-modernists who argue that both the object of an enquiry as well as process of interpretation are both constructed, are both moving completely away from the idea of an abstract reality and this can only be uncovered in the research process (Creswell, 2008).

### ***3.2.1.1 Choosing a Positivist or an Interpretivist Approach***

The selected methodology for this research is Case Study; it draws inspiration from the Interpretivist tradition, which requires that the researcher demonstrate a comprehensive understanding of relevant literatures around the research topic (Creswell, 2007; Saunders, Lewis, and Thornhill, 2009). Case study avail the research the opportunity to gather data that enhance the understanding of the research phenomenon (Ghauri and Gronhaug, 2005; Saunders, Lewis and Thornhill, 2009). Within this thesis the task is to understand the factors responsible for the growing trend of GSPs adoption in the shipping industry and

the impact on organisational performance. This approach is similar to that of Walsham (1995), whom stated that “our knowledge of reality is a social construction of human actors” hence requires the subjectivity of both the interpreter and the interpretation of the final thesis. It was previously mentioned that there exists varying perceptions with respect to the impact of this subjectivity owing to the various philosophies of science (Creswell, 2008):

- Positivists opine that there exist abstract realities, which can be understood by a rigorously conducted enquiry (Saunders, Lewis, and Thornhill, 2009). This relies on an acceptable level of experimentation without the inclusion of unforeseen variables hence the obtained results are assumed to be closely related to variations in the key independent variable (Creswell, 2008; Easterby-Smith et al., 2008). As already mentioned some positivist are comfortable with the idea of an “approximate truth” premised on the thought that each new enquiry increases our knowledge of originally assumed truth which can likely lead to an acceptance or rejection of original assumption (Psillos, 1999);
- Modernist approach places emphasis on the difficulty of interpretation particularly interpretations processes done by individuals with consideration for their own existing belief systems and social norms. It is however also a commonly accepted concept in modernist philosophies as it is also with empiricism, that there exists an abstract reality, only that the method of description is product of norms and beliefs (Saunders, Lewis, and Thornhill, 2009);
- In contrast to the previously discussed philosophies post-modernist

tradition oppose the idea of an abstract reality, they rather emphasise the constructed nature of the observed reality (Bem and Looren de Jong, 2006).

For the purpose of research design, empiricist will accept results obtained from non-experimental work in the instance of the exploration of a new field of study, so while this may not be accepted as firm conclusions case studies are helpful for identifying trends that can then be used for the development of a robust empirical enquiry (Bem and Looren de Jong, 2006; Yin, 2009). (Collier et al., 2002; Ernst Van Aken, 2005; George and Bennett, 2005; Goertz, 2006) all posit that it is possible to move from observation to theory in an Interpretivist approach however great care must be taken. One of the useful approaches in case studies is that Yin's (2009): Pattern matching. This recommends the use of existing literature in the development of a predictive model, which is in turn used for evaluation of findings. This allows for the development of a robust model, which gives a much wider coverage of the research area rather than merely describing the observations of a particular case (or group of cases). The approach relies on the internal reliability of the study hinging on the quality and robustness of the research material rather than extent of methodological rigour, as is the case in scientific methods (Yin, 2009). The emphasis of scientific methods is that results obtained must be replicate-able, generalizable, within a controlled environment must be formal (Cavaye, 1996). This is contrary to interpretivism, which places more emphasis on the ability to articulate the reason for the observed results (Jones and Hughes, 2001).

### ***3.2.1.2 Justification of the use of Qualitative research methods***

On a broad scope, there are two main research approaches: qualitative and quantitative, which are relatively contrasting in methods but have basic standardized elements (Flick, 2009). This research takes a cue from Creswell (1998 p.15) interpretation of qualitative style which states that it is “an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem [where] the researcher builds a complex, holistic picture, analyses words, reports detailed views of informants, and conducts the study in a natural setting” (Creswell 1998, p.15). There are several techniques that can be employed within a qualitative approach which include participant observation, grounded theory, semiotic analysis, discourse analysis or hermeneutics (Myers, 2009). This approach usually requires the collection of data through observations, documents, pictures, notes or individual thoughts. The qualitative approach employed in this thesis is to help developed a better understanding around factors that influence the adoption of GSPs in the shipping industry and even more the influence on organizational performance. To further justify this approach, certain elements of this research are highlighted in comparison to other previously successfully conducted research e.g. the uses of the words like “what” and “how” in the core research questions are elements of qualitative approach as was in the case of Yin (2009); (Dyer and Wilkins, 1991) highlighted that qualitative research is suitable for cases where an in-depth study is the focus; Creswell (1998) also noted that qualitative research is most appropriate in exploratory research environments more so where the area of research is just developing with very little comparable works just as is the case with this research; Myers, (2009) stated that qualitative research does not lay

emphasis on objectivity hence the research can play a participant observer or observant participant role. Hence qualitative research avails the research the opportunity to contextualize theory, which in this case possible theory behind the adoption of GSPs can be contextualized within real world scenery.

Having cited all the points above with which this research accurately coincides, this research has adopted a qualitative approach in its execution. The main data collection technique here interviews this is combined with analysis of available documents as presented by the participating organizations.

### **3.3 CHOOSING AN APPROPRIATE RESEARCH STRATEGY**

Galliers (1992) defined research strategy as “the means through which research is carried out” (Galliers., 1992). It includes the methods and style of data collection. There are quite a few critical issues to be considered in selecting a research strategy as identified by Yin (2009) namely; definition of the type of research questions being addressed; extent of the researcher control of the research environment and consideration for historical or contemporary events. These are however not the only factors that were considered in this thesis, some of the other factors considered include the uniqueness and complexities of the shipping industry, the need for empirical validation of the proposed research questions, complexity of expected results, the need for the study to be carried out within a natural setting, time and budget constraints, access to and availability of robust and comprehensive primary data. While this is not an exhaustive list, in combination with the previously outlined three points inferred

from Yin (2009) they present the required justification for the chosen case study approach. Hence a case study approach has been adopted for this thesis because it availed access to the real-life data essential for the carrying out this enquiry (Creswell, 2008; Easterby-Smith et al., 2008).

### **3.4 CASE STUDY RESEARCH STRATEGY**

There are several types of case studies; the type of research questions to be answered usually differentiates this, the common types of case study are explanatory/descriptive or exploratory (Yin, 2009). Saunders et al. (2000) describes exploratory case study as an approach that presents researchers with new ways to conduct research. This method begins with a broad search of literature and then eventually narrowing down to focal inquiry through interaction and discussions with experts in the researched field. Descriptive case studies are usually employed as a compliment to exploratory case studies. George and Bennett, (2005) argue that in more generic social science areas, real world scenarios often support the development of explanatory theories.

This thesis employs exploratory case study research; the focus is on the “what” and “how” of the GSPs adoption in the shipping industry. This research in effect presents future opportunities for research in this area, which is a fundamental advantage of case study as identified by Roethlisberger (1977) particularly with newly emerging areas of research. From previous sections, it has been established that GSPs is an emerging trend in the shipping and very little is known about the motivation behind this trend. This is made obvious by the dearth of

literature available in this regard. Even more so, the impact of this trend on organizational performance is largely unknown. This research therefore meets the requirement for emerging areas of research, which justifies the chosen research strategy.

#### **3.4.1 CASE STUDY OBJECTIVE: THEORY TESTING**

There are a good number of reasons why case study strategy is appropriate for this research some of which have been mentioned in previous sections of this thesis. Fundamentally, case studies are helpful for describing phenomenon, building theory, testing theoretical relationships and concepts Remenyi, (1991). They are particularly appropriate in cases where the aim involves theory building and description as advocated by Remenyi (1991). Furthermore, case studies avail the researcher their strength in the inductive interpretation of findings as noted by Irani (1998) even more so for exploring defined theoretical concepts.

Case studies can also be used for validating theoretical propositions, where they put forward a deductive interpretation to the research in which comparison would be made between new data and previous hypothesis and findings. Benbasat et al., (1987; 1988) and Yin (2009) all strongly advocate for the deductive use of case study strategy. This research adopts a case study strategy in an inductive approach for the description of the factors influencing the adoption of GSPs in the shipping in the shipping industry and the impact on

organizational performance using the model presented in chapter three earlier.

### **3.4.2 CASE STUDY APPROACH: SINGLE VERSUS MULTIPLE CASE STUDY RESEARCH**

Following the decision to use a case study approach, there is need to take into consideration the choice of a single or multiple case studies. This is a decision that must be made with great care because it will eventually inform how data collection will be carried out in fact Benbasat et al., (1987) suggested that a clear differentiation must be established between what is being studied and the context in which it is situated. In this case single case study has been selected in order to allow for an in depth study of factors influencing the adoption of GSPs and the impact on organizational performance. There are several categories of single case studies as shown Benbasat et al., (1987):

- Critical case – pursues a critical test for the validation of a particular theory;
- Extreme or unique case – documents the exact nature of a phenomenon that is lacking in understanding;
- Representative or typical case – this captures the conditions of an existing typical situation;
- Revelatory case – seeks to unravel a previously non-accessible phenomenon;
- Longitudinal case – establishes noticeable change in patterns, casual



mechanisms over time over time.

Single case studies are considered to be more appropriate for theory generation and testing as noted because they avail the researcher the opportunity to fully explore the research area allowing a robust understanding of the contingencies of the context and all other elements of research area (Yin, 2009), this is a feature related to Bonoma's drift stage (Benbasat et al., 1987). Furthermore, single case studies are often prerequisites for the application of multiple case studies hence they are complimentary to each other and not necessarily in an order of preference. Another fundamental compliment of single case studies is the practicality of the research design; this is even more important where the research requires contact with real the world (Easterby-Smith et al., 2008; Yin, 2009). A common problem with this approach is the access to and availability of interviewees. Additionally, it is important to be able to balance the rigour of a robust research with relevance of findings to the practitioners (Bluhm et al., 2011; Ernst Van Aken, 2005; Hodgkinson and Rousseau, 2009; Kieser and Leiner, 2009). There are some contrasting opinions about the suitability of single or multiple case studies. For instance, Herriott and Firestone, (1983) argue that findings from multiple case studies are inherently more reliable than those from single case studies owing to the ability of multiple case studies to allow for cross comparison as well as the opportunity to replicate the research. These views are however evenly matched by the problems associated with finding several suitable cases. In addition, some other researchers opine that lack of comparison associated with single cases are very well compensated for by the depth of knowledge derived from single case findings (Gerring, 2007; Mahoney, 2000).

Yin's (2009) pattern matching is further helpful in this regard in ensuring that the results from single case studies are comparable to wider literature. While multiple case studies allow for cross comparison and cross-referencing, it is unclear what the optimum number of cases to use is. Gable (1994) and Eisenhardt (1989) suggest a range between four and ten but the ideal number is left to the discretion of the researcher. Some of the complications this presents is the justification of possible variation in the outcomes and as well as the complexity associated with organizing these cases (Dyer and Wilkins, 1991).

### **3.4.3 DEVELOPING INSIGHTS FROM A SINGLE CASE STUDY AGAINST MULTIPLE CASE STUDIES**

The adoption of GSPs in the shipping industry is a budding area of research, even more so is the impact of this on the performance of shipping firm as has been severally cited in earlier portions of this thesis. While there has been literature on related issues from different perspective, the first conceptualization of green shipping in literature did not emerge until the published work of Lai et al, (2011). This largely influenced the availability and access to organizations that are adopting/implementing this practice. Another additional constraint is that these organizations are still in the learning process of GSPs. Yin (1994) posit that single case studies are effective for theory testing and building particularly in developing areas of research as is the case in the adoption of GSPs. He presented pattern matching as a method for strengthening findings. Pattern matching is done by relating findings of research to existing literature as has been done in

the conceptual model chapter of this work. Sammaddar and Kadiyala (2006) also compliment Yin's (1994) argument by stating that comparing case study findings to findings from previous research can reasonably contribute to theoretical understanding, careful consideration must however be given to similarities and/or differences observed during this repetitive process as this is helpful for improving understanding of the study.

In the previous section, the works of Eisenhardt (1989) and Gable (1994) were cited advocating for multiple case studies on the grounds they present the opportunity to compare findings across several cases. While this is not possible with single cases, it is sometimes possible to make comparison over time (considering the development of the project) or place (in consideration of multiple sites, sub-projects or sub-units of the organisational). The claims of Eisenhardt (1989) of the number minimum number of cases (four) sufficient for the robustness and validation of research and findings is evenly matched by the evidences of certain profound single case studies in social science (e.g. Kanter, (1977), Gouldner, (1954)) as cited by Dyer and Wilkins (1991). These authors assert that the cited single cases were and are still very instrumental in advancing and shaping their respective disciplines and the field of social science as a whole hence while the intention is not to dispel the claims and contribution of Eisenhardt (1989), it is obvious that single case studies are not any less effective in advancing research and increasing knowledge of a particular subject, however great attention must be given to depth of explanation and insight derived single cases.

The debate around single or multiple cases may not be as vehement as it appears. Single cases often take a pragmatic approach based on the confidence that the robustness of the research design as well as richness of the findings of an in depth study will enhance the understanding of the subject area which can be useful for generalizations (Dyer and Wilkins, 1991). Dyer and Wilkins (1991) further suggest that findings from single case studies were sometimes more useful than those from multiple cases considering the fact that single case prioritizes quality of data over breadth of comparison as is the case with multiple cases. Since there is no definitive answer for the optimal number of cases, the cited work of Eisenhardt (1989) and Gable (1994) only offer recommendations.

This thesis follows in the steps of Dyer & Wilkins (1991) taking after their research approach as well as section of case study to embark on a single in-depth case study. In this thesis, an identified research gap is being explored. The intention is to break new research grounds by helping to understand the factors responsible for the adoption of GSPs in the shipping industry and how this impacts on the performance of shipping firms. This research model strongly supported by empirical findings will offer significant contributions to the budding branch of literature in this regard. These findings will be valuable to both academia and industry by providing deeper level of understanding on the research area, increasing literature as well as improving decision making by helping decision makers unravel certain previously unfound information. Since this is also a new area of research, it will also open up opportunities for future research directions.

Considering the fact that the selected case study was mostly due to the availability of researched organization in combination with scarcity of suitable cases (a common factor that informs selection of single cases), it may not be possible to generalize the findings from this research. This however does not compromise the quality of this research and its findings in any way. The necessary rigours and requirements for robust research has been observed as can be seen throughout this work hence, while this research may not offer generalisation, it does provide profound in-depth understanding of the research area as well as a basis for comparison with other similar research both now and in the future.

In conclusion, it is necessary to state again that owing to the fact that the research area is still growing and in fact the shipping industry can still be considered to be in the learning stages of GSPs adoption/implementation, it was most suitable to use a single case. This decision can also be further justified by the works Hakim (1987) and Yin, (1994), hence it was therefore decided that broad exploratory study was most appropriate.

### **3.5 EMPIRICAL RESEARCH METHODOLOGY**

Having presented justification for the appropriateness of qualitative case study approach for this research, the author in this section now presents an integration of these factors into the empirical research methodology adopted for this study. The empirical methodology process is illustrated in detail in figure 4.1 below.

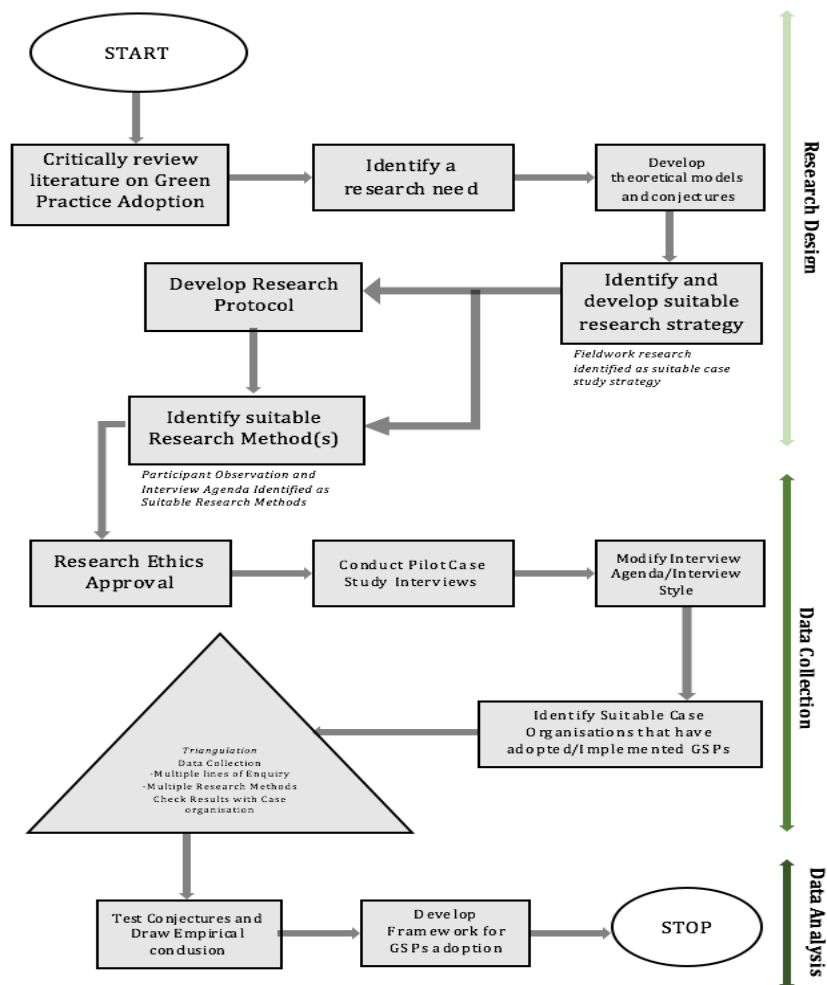


Figure 3.1 Empirical Research Methodology Process (Personal Collection)

### 3.5.1 RESEARCH DESIGN

The first of stage of the empirical research methodology was the research design. The research design was adopted based on an Interpretivist framework. A critical aspect of the research design was developing appropriate research questions from existing literature and a conceptual model that was to be tested in the interview phase. From the literature review conducted, a reasonable number of research conjectures have been developed to assist in the

interpretation of data collected. Since research in GSPs is still budding, a single in depth case study has been adopted. In this section, the actual research protocol for conducting fieldwork as suggested by (Friedman, 1987) is presented.

The development of the interview questions was also a very strategic part of the research method; the interview questions were comprehensively developed to reflect and answers the research questions that had been raised through robust examination of literature. The interviews were used during the formal inquiry process and a copy of it can be seen in the appendix section. The research method used in this research was largely influenced by the nature of GSPs being a developing aspect of maritime literature, hence there was a need to allow for the capturing of robust content. Furthermore, considering the fact that adoption of new practices is usually associated with several factors (organizational, technological and human) as will also be seen in later chapters, as well as the nature of the specific research topic being explored, it was more profitable to direct the study towards senior level member of staff in the shipping case study company. These people were considered most appropriate to answer the research questions being at the helm of affairs and hence responsible for every decision and results the company achieves. The use of alternative method of data collection was not very helpful however a complimentary questionnaire was also used to verify the level of assertion of the interview questions. In the next section below, the rationale for the interviews and selection of individuals to be interviewed is set out.

### **3.5.2 CASE STUDY DATA COLLECTION**

The second phase of the research methodology is the data collection. Considering confidentiality and subjectivity of the issues surrounding this research, it was necessary to be able to capture these issues within the context they exist as recommended by Yin, 2009 hence the research method was developed with this in mind. The empirical data for this research was primarily obtained by carrying out in-depth semi-structured interviews with experts in the shipping industry as well as through participatory observation (Atkinson and Hammersley, 1994; Myers et al., 1997). This helped to gain insight into the factors that influenced the adoption of GSPs and the impact of organizational performance. In order to ascertain the reliability of the research method, a pilot study was carried out with management level staff of shipping firms. This greatly improved the quality of the research by helping to eliminate any form of ambiguity existing in the interview questions. It further enhanced the data collection process by ensuring that the right questions were being asked contributing to a robust data collection process. It is necessary to note that same shipping company was used for the pilot study hence; the result from the pilot study formed some part of the analysis section of this research. The selection of the case organisation for this research was because the organisation had been identified to be actively engaging in adoption GSPs and being one of the very few organisations currently in the adoption process, they were considered appropriate as case organisation. The findings from the research may however not be generalizable on the basis of context and level of development of the country that the shipping firm is operation from and while this may appear to be a limitation, it is easily eliminated by the fact that no previous research has examined GSPs adoption



factors and so the findings from this research provides a first point of call from further research that could now consider other varying factor like context and organisational attitude etc. Additional data gathering research methods and lines of enquiry included obtaining supporting evidence through informal conversations; policy documents; environmental reports etc.

The table below (Table 3.1) presents a collection of the extensive list of data sources used in this study. The use of multiple methods ensured data triangulation, thus contributing towards the reliability and validity of the findings for this study. These findings were later cross referenced with the environmental managers of the case organisations during further email and phone conversations to further affirm the triangulation process hence providing a greater level of validation for the results obtained.

Table 3.1 Empirical materials used in the case study

<b>Empirical Material</b>	<b>Media</b>	<b>Explanation</b>
Interview Transcripts	Electronic/Paper	<p>Final interviews with environmental manager, ship operations managers and business Managers</p> <p>Final informal interviews with environmental</p>

		manager, ship operations managers
Documents	Electronic	Environmental Policy documents Environmental reports Clean Cargo Working Group Reports Vessel Fuel Consumption reports
Emails	Electronic Documents	Meeting Agendas Communication with Vessels managers Comments on drafts reports

(Source: Personal collection from Participating Organisation)

### 3.5.3 INTERVIEW PROCESS

The interview process was carried out in a formal setting and the interview agenda can be seen in appendix section. The questionnaire was mainly consisted of open-ended questions to allow for the interviewees to fully express themselves while answering the questions. The interviews were conducted with senior management level staff of the shipping firms. Their job functions ranged between, environmental, ship operations management and business management departments. The interviews were conducted on a one to one basis and at a convenient time for the interviewee and in order to allow each

participant the freedom of expression needed for a productive session and they lasted averagely lasted for about one hour thirty minutes. In addition to formal interviews conducted, informal sessions were held which also contributed valuably to the data collected. All the interviewees were people whose job functions cut across the issue being research hence their contribution was very valuable as they were able to present a rounded perspective to the issue. All the interviews were conducted in formal setting away from the distractions of the office set up and all forms of communication (verbal and non-verbal) were taken into consideration in the data collection process.

Table 3.2 (in the appendix) summarizes the list of all the participants. For reasons of confidentiality, names of the people are excluded and pseudonyms are being used to represent the case organisation's names. The table consists of four columns. The Role/Position connotes the job function of the individual and the position theta the hold in the organisation. The job description column clearly explains what the individual does daily. The last two columns indicate the years of shipping experience and the organisation they work for. This has been included to further validate the data collection process. In total 11 (eleven) interviews were conducted as will be seen in the table below. It was no longer necessary to conduct anymore interviews as the responses as this point were beginning to mirror showing that the process had reached a point of saturation.

#### **3.5.4 CASE STUDY VALIDITY**

In order to address the issue of internal validity of the data obtained which is

common with qualitative research (interview, documentaries etc.), each interview was recorded using a digital audio recorder and then transcribed. These transcriptions were then sent to the interviewees to ensure that there were no discrepancies as well as to eliminate any form of bias as a result of the interviewer's opinion. In addition to this, it was ensured that the data collected centered around similar facts relating to the issue being researched with the omission of any unrelated information that could skew the data being gathered. The procedure for data triangulation used in this study was inferred from the works of Jick (1979) and Pan and Tan, (2011), hence the researcher is confident about the accuracy of the research process and findings.

### **3.5.5 CASE STUDY DATA ANALYSIS**

The final phase of the research methodology was the data analysis and testing. The data obtained through the interview process described above was triangulated and then analysed to arrive at empirical conclusions. This research made use of qualitative data analysis technique with the help of NVivo software, which is a qualitative analytic tool and largely served as a data storage, retrieval and management purposes. The data analysis and development of codes was done manually and it involved the analysing the meaning of words and actions within the context of the case study (Ramanath, 2009). The process was iterative and each iteration led to further development of the coding structure as well as more coherence in the analysis (Corbin and Strauss, 2008). At the initial stage, four interviews were conducted and analysed. This allowed the researcher to

reflect and decide on the suitability of the question structures leading to the modification of some questions and the omission of other leaving only those that were most suitable; This served as the pilot study. A further seven interviews were conducted at which point a pattern of responses had emerged leading to the conclusion that the phenomenon Glasser and Strauss (1967) referred to as “saturation” had occurred hence further data collection was predictable. To enhance the data analysis, all interviews were recorded with consent of the respondents and transcribed without any alterations. Furthermore, notes were taken alongside the recordings about the emerging main themes and summary form was completed after each interview including the main concepts and theme as well as any questions arising. Completing the summary form helped with improving the interview protocol as the interviews progressed considering all emerging theme during the data collection. The complimentary secondary data (environmental/emission report and CCWG reports, environmental policy documents) were also studied thoroughly to support findings obtained from the interview process.

### **3.5.6 THEMES AND CODE DEVELOPMENT**

The steps followed in the data analysis process are graphically illustrated below.

### Qualitative Data Analysis Process

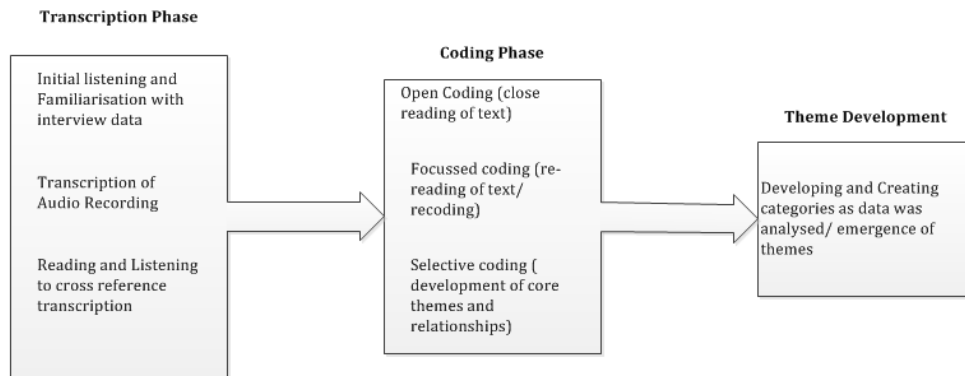


Figure 3.2 Code Development Process (Diesing, 1971)

Thematic analysis occurs in three distinct stages as stated below:

- Sampling and designing;
- Developing themes and codes;
- Validating and using the codes.

The second stage encompasses three methods/ways for thematic code development. This could be theory driven, previous research/data driven or inductive/new data driven (i.e. from raw data). These methods seemingly form a continuum from theory driven to data driven with a corresponding increase in difficulty with respect to analysis and this continuum will likely be laden with increasing uncertainty. Theory driven code development usually avails the researcher the opportunity of taking a cue from previous works or research while data driven code development presents the researcher with the freedom that isn't constrained by existing theoretical positions and while they both seem to differ in approach they are both in consensus in the fact that they channel research towards theory development.

Data driven codes are inductively extracted from raw information obtained during the interview. It is the responsibility of the researcher to interpret them and hence construct a theory from the obtained findings. When the codes developed are closely related to the raw information, it becomes easier for several people to interpret the findings similarly which further increases the reliability of the results. It is necessary to note that data driven code is highly context sensitive hence it is very likely for its validity to be measured against criteria and construct. This feature of data driven approach makes it a favourite for researchers. Furthermore, the direct inference and interpretation of the raw information without the influence of preconceived thoughts allows the researcher to be able to holistically assess the data and extract both evident and intricate elements hidden within the data.

Developing codes from previous research could also be valuable as it allows the researcher to build on existing patterns in the interpretation of the data, great care must however be exercised in order not to limit the interpretation of the data to the existing interpretations. There must be a conscious effort to identify consistencies and anomalies as the data is being interpreted. It will be observed that as more cases are examined and as more anomalies are discovered, the interpretation and hence code development will drift further towards data driven approach.

Diesing (1971) commenting on both the deductive (theory driven) and inductive (data driven) approach stated that the former is based on the assumption that

there are laws/principles that apply to the researched phenomenon hence there is some guidance in the interpretation of the results, which will likely be through hypothesis testing. On the other hand however, the inductive approach will usually try to establish patterns based on facts from the information/data studied. There are also disadvantages to both methods some of which Diesing identified to be that inductive approach is usually open ended while the assumed concepts/models of the deductive approach usually changes as the inquiry progresses.

In conclusion, it is useful to note that all these approaches can be applied to any type of raw data irrespective of the type of study (single or multiple case studies of individuals, groups or organizations). The more important issue is that the code development must satisfy the requirements that validate its suitability and reliability. These requirements will be discussed in the next section.

#### **3.5.6.1 Requirements for a meaningful code development**

A good thematic code is one that wholly portrays the richness and quality of the phenomenon researched. It is one that has the maximum tendency to produce a high reliability and validity from the perspective of scoring and scaling a qualitative research. The following are the elements of a good code.

1. A label (name)
2. A definition of what the theme concerns (characteristics/issue that make up the theme)



3. A description of how to know when the theme occurs
4. A description of any qualification/exclusions to the identification of the theme
5. Examples (positive & negative) to eliminate confusion when looking for the theme

### **3.6 CASE STUDY PROTOCOL: AN OPERATIONAL ACTION PLAN**

A case study protocol as defined by several scholars (Miles and Huberman, 1994; Pervan and Maimbo, 2005; Yin, 2009) can be considered to be a set of guidelines that helps establish the structure of a case study research. It is sort of an outline of rules regulating the actions and conduct of the researcher and the research as a whole (Yin, 2009). A case study protocol further encapsulates the research tool for data collection. (Remenyi, 1991; Runeson and Host, 2009; Yin, 2009) strongly recommend the use of research protocol for the following reasons:

- It is one good way to increase the reliability of the case study research; and
- It provides the researcher with a systematic guide to carrying out the research in a rigorous manner.

Asides the points already mentioned above (Miles and Huberman, 1994; Yin, 2009) also suggest that a protocol can assist the researcher by enhancing the communication with participants hence improving the data collection process and the research as a whole. Yin (2009) corroborated this argument by recommending the essential components of a case study research protocol namely:

- An overview of the case study project;
- Fieldwork research procedures;
- Questions addressed by the research, and;
- The research output format.

He stated that above elements of the case study report would help the researcher focus on the research topic as well be able to anticipate any potential problems. Owing to the arguments put forward by these scholars, this research therefore adopted the suggested outline of Yin (1994) and a further description of each section follows in subsequent sections.

### **3.6.1 CASE STUDY OVERVIEW**

In this section, an overview of the research is presented: it describes the main issues to be investigated by the research (Yin, 2009). As has already been established in previous sections of this thesis, there is a dearth of research and literature on green shipping, its adoption, and even more so its impact on the performance of shipping firms (Lai et al, (2011) Lun et al, (2011)) hence this research seek to provide in-depth understanding of factors that influence the adoption of GSPs and its impact on organisational performance. In order to do this, empirical data is to be collected from and evaluated. The critical issues to be critically investigated in this research include:

1. Why are shipping firms beginning to adopt certain GSPs?
2. Is the implementation motivated by institutional variables (external pressures) such as social norms and customer pressures?
3. What are those “institutional variables” and how are they contributing to the diffusion of GSPs?

4. What is the effect of the adoption of GSPs on firm performance (service & financial performance)?

### **3.6.2 FIELDWORK PROCEDURES**

Case study research is characterised by studying events in their natural setting (i.e. not within a controlled experimental region), hence it is necessary to account for the realities of everyday life within the research plan (Yin, 2009). Some of these realities include meeting cancellations, withdrawal of participants, unavailability or unwillingness of organisations or individuals to make certain documents/information available etc. all of which the researcher has little or no control over. These realities have to be factored into the research design because they can profoundly influence the research as a whole. This further emphasizes the importance of an appropriate fieldwork procedure. Iterated below are the key fieldwork procedures observed during this research:

- Defining the interviewees: Since the focus of the research is on factors influencing the adoption of GSPs and its impact on organisational performance, the interviewees were chosen from senior management level within a shipping that is currently adopting GSPs. This is because these people had job functions that were closely related to GSPs adoption and implementation and even more so they were at decision making level within the organisation hence they not only had the expertise knowledge and exposure needed but also the authorization to influence decisions. Their jobs functions ranged from Environmental management to Business

and Operations Management. This was done in order to allow for a robust data collection process while also eliminating any bias that could string from any individual's perception. The author made use of data triangulation to increase the accuracy and reliability of the data collected and data through three methods. Firstly, formal interviews were conducted with interviewees from the said job functions within the organisation on an anonymous basis. Then, information from several informal sessions with other members of the operations team was also used and lastly, documentations on environmental performance report were also used.

- Identifying Suitable Data collection methods and establishing lines of enquiry: Since interviews are the main data gathering method, an interview agenda was developed (see Appendix) to help guide the interview process and to ensure that the data collection process is both robust and rigorous as required by the research. The interviews were conducted with management level staff the chosen shipping company, the interviews were recording using a digital audio recorder and then transcribed. Other lines of enquiry involved informal verbal chats/discussion with members of the operations team who are at the forefront of GSPs implementation. In addition to this, documents relations to emission and environmental performance were analysed to compliment information obtained from the interview process.
- Allowing for contingencies in data collection process: when and where necessary meetings were rescheduled to a time more convenient from the interviewee in order not to have them under time constraints and hence

compromise on the quality of the data collected. The willingness and cooperation of the organisation helped eliminate the chances of participants withdrawing.

- **Developing an interview Schedule:** To accommodate for the unpredictability of in the data collection process, a schedule containing the agreed date and time of the arranged interviews was developed in advance. The interviews were scheduled over the period of a month to accommodate the busy schedules of the people involved, which included frequent travelling in some cases. The time period scheduled for the interviews also allowed the researcher some time to reflect on the already conducted interviews and to make any necessary improvements on subsequent ones. This was useful both for the improving the process and the quality of information gathered. The interviewees were also duly notified of the time required for the interview which average lasted about an hour and a half.
- **Ethical Issues:** In any form of research there are ethical considerations to be considered, this is to ensure that no one is put at risk in any way during or after the process. In this regard this research obtained the due ethical approval for data collection by subjecting the interview protocol to the university's standard ethical approval process. This process included the submission of a duly completed ethical approval form with a copy of the questionnaire. Afterwards, this research followed the due process as presented in the ethical approval documentation. The participating organisation in this research had agreed to participate and on the basis of anonymity hence the name of the organisation/individual participants

have been omitted in this thesis.

A case study is characterized by a robust and rigorous process of in depth of a subject/issue, in this research; the interview agenda provides the research with a guide to the data collection process. The researcher consciously anticipated opportunities during the research that could add value to the research. This required some flexibility on the part of the researcher to vary the interview methods using structured, semi-structured and unstructured as was considered necessary. In addition, to this, the research made use of data from other sources (i.e. documents and participants observation). The use of multiple data sources allowed for triangulation an approach that is highly recommended by several researchers (Miles and Huberman, 1994; Yin, 2009; Neuman, 2000) as a way on improving both the reliability and validity of qualitative research (Chau, 1999).

As suggested by Yin (2009), the voluntary consent of the participating organisation/individuals was sort using a consent form detailing the aim, objectives and requirements of the research was prepared and used to obtain the consent of both the organisation and the individuals. Since the case study organisation may be unaware of the academic procedures, it was necessary to explicitly intimate them with respect to the process of publication and dissemination of results obtained from the research. Finally, feedback was from the research was also given to the participants of the study. This is very important as highlighted by Runeson and Host, (2009) to be a contributory towards the long term trust and validity of the research. This required the transcripts of the interviews be made available to the participants as well as

copies of the analysis and results.

### **3.6.3 CASE STUDY QUESTIONS**

At the heart of the research protocol is a set of questions that drives research. These questions are not the same as those asked in the interviews; in fact they are not questions to the participant but questions for the researcher. These questions acts as reminder to the researcher and help to prompt and direct the researcher on the with respect to the data required to test the proposed relationships in the conceptual model. They also help to maintain the researcher to not get distracted during the interview process. Yin (2009) suggested that notes should be made of the possible source of evidence to support each question, as this can be helpful during data collection. In the instance of this research the questions are as follows;

1. Why are shipping firms beginning to adopt certain GSPs?
2. Is the implementation motivated by institutional variables (external pressures) such as social norms and customer pressures?
3. What are those “institutional variables” and how are they contributing to the diffusion of GSPs?
4. What is the effect of the adoption of GSPs on firm performance (service & financial performance)?

### **3.6.4 RESEARCH OUTPUT**

This section presents the output from of the empirical data gathered in the course of the research; this was necessary because it helped to prepare the author for the volume of data that was to be collected. It helped to highlight issues that could arise due to accumulation of voluminous data and in turn

improve the quality of the research output. The author addressed these issues by aligning the questions in the interview agenda to the conceptual proposition. Great emphasis was laid on the usefulness of each question to add value to the research objectives if not it was not to be included in the interview agenda; hence this helped to further develop the interview agenda and to improve the output. An outline of the case study report structure is presented below; it was helpful facilitating the data collection process. It is necessary to note however that the presence of an outline did not necessarily confine the research to the presented protocol since plans can sometimes change as the research progresses requiring that the methodological approach be flexible as noted by Yin (2009).

### **3.7 CONCLUSIONS**

This chapter discussed the research methodology adopted to execute this research. The Interpretivist approach was taken which has an impact on research design, data collection and analysis as well as the extent of generalizability of the results/findings. Considering the adoption of GSPs which is a real-world process, a case study was considered an appropriate research framework. This allows the researcher to observe the said phenomenon in its natural state hence enhancing theory building and testing. It has been previously discussed that there exist a range of case study options. Single case study has been adopted for this research and access to other relevant documents helped to build greater understanding of the topic. Since GSPs is only just emerging, it is not clear whether multiple instances could have been found that fitted into the research aims and within the available time scale. The development of GSPs



adoption framework was also a fundamental goal as this would provide regulatory authorities as well as intending shipping firms with a tool to enhance GSPs adoption. To execute the case study method, semi-structured interviews were the main data collection tool but this was complimented by other relevant organisational documents. This allowed the research to achieve the required triangulation of data sources as well provide a vast amount of data about GSPs adoption and the perceived impact on the firms' performance. The following chapter will present findings obtained. In summary, this chapter discussed the research methodology adopted to researching the drivers of GSPs adoption and the perceived impact on firm performance. The research design followed and Interpretivist approach relying on a single in-depth case study on a shipping firm/port. Data collection occurred over a decent period of allowing for a robust account of the respondents. The findings were used to develop a GSPs adoption framework as will be seen in subsequent chapters.

## **4. CASE EMPIRICAL DATA ANALYSIS**

### **4.1 INTRODUCTION**

This chapter presents the data collected through interviews. The subsequent sections will present transcripts of the interviews as well as analysis using themes and sub themes that have been developed during the coding process as has been discussed in previous chapter. The data collected will help in answering the research questions set out at the beginning of the research and will cover topics which include understanding of GSPs adoption, drivers and enhancers of GSPs adoption as well as perceived constraints of GSPs adoption.

### **4.2 BACKGROUND TO CASE ORGANISATION**

This section presents the business context of the sector being examined, it includes a brief introduction of the case study organisations highlighting years of shipping experience, employee capacity and all other information necessary to establish them as appropriate case study organisations for this research. It is also necessary to note that pseudonyms have been used as representations of the actual names of the case organisations. This is in line with the anonymity agreement as set out in the ethical approval forms however all other information provided is accurate and valid as of the time the research was conducted. The use of two organisations from seemingly contrasting context in terms of geographical location and economic development allows for comparison of observations where possible as well as enhance generalisation.

#### **4.2.1 OVERVIEW OF ALPHA SHIPPING LINE**

The company now known as Alpha was originally established in 1902. The company has since grown to become one of the leading international shipping and port operators. It currently oversees 61 companies with a staff capacity of over 6250 personnel. Alpha's business interest includes automotive services, tourism services, information technology services, airline services, fuel services, insurance services amongst others. It currently has over 50 agent offices both within and outside Turkey (its origin and current headquarters). This research focusses on the shipping aspect of Alpha's business which is comprised of over 50 container vessels and about 5 Bunker Barges. The company boast of nearly 70 years of shipping experience and it operates regular Liner services between ports in the Black Sea and the Mediterranean with new Liner operations plying to African sea ports. Its container vessels are equipped with different types of containers including "open top", "high cube", "flat rack", "pallet wide" and "reefer" all totalling 83,600 Teu (Twenty-foot equivalent unit).

#### **4.2.2 OVERVIEW OF GAMMA PORTS**

Gamma ports is arguably Britain's biggest and busiest sea port, and possibly one of the largest in Europe. It is estimated to process over 4million TEUs (Twenty-foot Equivalent Units) containers and welcomes about 3,000 vessels yearly some of which are the most modern and largest vessels available in recent times. This is possible because the port provides very deep waters as is required by large vessels some of which are Very Large Crude Carriers (VLCC). This port plays host to more that 30 shipping lines from all over the world which in turn provides up

to 90 shipping services to and from about 400 ports all around the world. Gamma take further advantage of its unparalleled rail and road links to facilitate the distribution of merchandise to midlands part of the UK and further on. This make Gamma port a pivotal part of UK trade enhancing easy movements of goods while delivering exciting benefits to the customer, community and the UK shipping industry. Gamma ports employee capacity is over 2,500 whom through their dedicated services excel at delivering great customer services. This has help the port maintain its lead in the industry.

#### **4.3 ADOPTION OF GREEN SHIPPING PRACTICES**

##### **4.3.1 DEFINITION AND UNDERSTANDING OF GREEN SHIPPING PRACTICES**

From the interviews conducted, it was gathered that there appears to be a growing understanding of GSP. Although previous research focussed more on specific aspects of shipping operations in their definition of GSP such e.g. Krozer et al., 2003 who focussed on the technical activities and Celik, 2009 who sited business process. The findings of this research show that the definition of GSP from industry perspective considers all functions jointly in its definition of GSPs. Some of the definitions obtained during the interview process include:

*“all actions you do to reduce your environmental impact, so it is every effort to minimize the negative impact of shipping activities on the environment... so whether it is technological or through business practices.... it means all efforts” Environmental Manager (Alpha Line)*

*“exploring ways to minimise the negative impact of your shipping, shortening shipping routes, minimise carbon emission per TEUs, explore more effective ways to deliver product and minimise transportation/number of vessels used etc.” Environmental Manager (Gamma Ports)*

This is very similar to the definition of Lai et al, (2011) which defined GSPs as the “sustainable handling and distribution” of cargoes. The participants further emphasised that GSPs is not confined to the shipping industry and would require the cooperation of stakeholders within and outside of the shipping industry. This is particularly insightful as the focus has usually been placed mainly on the shipping industry. Some of the interviewees expressly stated that:

*“I particularly think that it is the collaborative effort of all parties in the within a and outside the shipping supply chain to ensure a more efficient transportation of goods with the least possible impact on the environment...”*

*“The shipping lines cannot effectively do it themselves...”*

*“there is a need for collaboration between all stakeholders to effectively tackle global environmental pollution even more so in the shipping sector...”*

It should also be noted that GSPs is still in the early days. As previously stated, this concept was only conceptualised by Lai et al, 2011 although there had been previous similar works which largely focussed on individual aspects of shipping operations. This thought was rightly validated by the interviewees who all agreed that they are in the learning phase of this concept. Some of their exact words are captured below.

*“It is a new concept for us and we are still in the learning phase”.*

*“For the shipping industry it is about 8 to 10 year but for us it is very new”*

*“It is only about 2 to 2.5 years and we are currently the only company practicing GSPs in this region”*

There is however, evidence to support the fact that reasonable work is being done in this area. The GSPs cited in their definitions showed that the company is dedicated to full adoption and implementation GSPs. These include membership of professional organisations (CCWG, ECOVADIS), vessel optimisation, route optimisations, investing in vessels to meet regulatory requirements, setting targets for emission levels, collaborative research activities etc. all of which are striking elements of GSPs as conceptualised by Lai et al, 2011. This research thus validates Lai et al, 2011 conceptualisation of GSPs which was previously requiring validation.

Additionally, it was interesting to discover that it appeared that the knowledge of GSPs depreciated with increasing distance from the core i.e. the further away the job functions of the respondent from interaction with the environmental functions, the less they knew about GSPs. This was evident from statement such as this:

*“The environmental manager will be in the best position to answer that question, but I know that we are heavily carrying out a lot of improvements works on our vessels in order to be certified as well as meet IMO regulatory standards.”*

*“Frankly, I have no idea how that is done, we are a more client oriented department”*

*“we request whatever information that the clients ask for and then present it to the client.”*

This highlights the work needed to be done in order to ensure the total diffusion of GSPs adoption. The participants did admit the effort of the Environmental manager in disseminating necessary information as can be seen in this quotes:

*“we request whatever information that the clients ask for and then present it to the client.”*

*“when CCWG shares their results, they share with us and with every other party that requires it.”*

Hence the problem does not appear to be due to the inability/inefficiency of the environmental office but more so about individual interest which is hinged on the business culture of this region. This can be inferred from the following quotes:

*“With respect to other distant departments it may be quite indifferent. Generally, being green is not a common business culture.....so the popular idea would be indifferent and so the idea would have to be learned”*

This further emphasis the need for collaborative effort of stakeholders within and outside the shipping industry in order to ensure the successful adoption of GSPs. Having established a reasonable understanding of GSPs by the case study organisations, this research sought to identify the what drives the adoption of GSPs. This is subdivided into the sections below.

#### **4.3.2 THE EXTENT OF ADOPTION OF GREEN SHIPPING PRACTICES**

This research sort to discover how far reaching the adopting if GSPs is within the case study organisations. This is to give an incline of the industry’s perception/reception to the idea as a whole. The findings from the research showed that the extent of the adoption in the case study organisations can be considered to be progressive. This is so because there exists evidence to suggest



that the observed organisations are making good effort to adopt and implement GSPs however they do not claim to have fully imbibed the idea. Firstly, the previous section highlighted that GSPs is only about 10years old in the industry as a whole and the observed organisations are just under 3 years in the pursuit of GSP adoption. Nonetheless, it can be observed that GSP is being progressively implemented. While the extent of adoption could only be largely measured by the organisations' effort to reduce emission, there is reasonable evidence to suggest appreciable effort to implement GSPs. Some of this evidence is found in the following quote by some of the participants;

*“our CO2 emission has improved by about 3% and we also calculate our performance in house and from 2011 to 2015 we have made a 12.5% improvement in 4.5 years.”*

*“we set targets, and in fact it is one of the rules of CCWG, you need to set targets and try to achieve them. Our target is to achieve 20% reduction by 2020. I think we can achieve it and from my opinion I think we can surpass it.”*

*“we are striving for a 30% reduction in our carbon intensity that is to reduce our CO2 emission per TEU and at the moment we're about 26.4% from where we started so we're making good progress and that is just one of them, we also have objectives and targets for sulphur dioxide which is about 18% and Nitrogen dioxide which is about 20% so we monitor all these things continually to drive them down.”*

*“We have specific and standard ways of measuring our environmental performance. It is usually filled after every voyage. Each vessel completes these standardized sheets and we monitor our fuel consumption, distances and all operational specifications of the voyage and then we report to CCWG and they calculate according to IMO and other regulations and they give us our score.”*

From the quotes above, we can see that these organisations, have been very specific in the targets for emission reduction and have been able to make appreciable progress in reasonably short times. This is indicative of progress. Additionally, these organisations also highlight membership of institutions that impose appreciable pressures on them to be environmentally responsible by setting targets and conducting regular audits as can be seen below, this is further combined with the creation of an office/appointment of an environmental specialist to oversee these activities within the organisation.

*“we are a member of CCWG, which is dedicated to reducing carbon emission and other forms of emissions, which have negative impact on the environment. We are also trying to reduce our fuel consumption in order to reduce our carbon footprint”*

*“becoming a member of CCWG is a big impact in trying to reduce our emission and trying to be more transparent in the operations of our vessels”*

*“For the shipping industry it is about 8 to 10 year but for us it is very new and in turkey it is really new as well. It is only about 2 to 2.5 years and we are currently the only company practicing GSP as well as being a member of CCWG also.”*

*“we have a position/office that oversees this aspect and that’s me. My position is Environmental Policies Specialists.”*

*“My main role really around compliance, I look after a number of departments, as I mentioned before I’m doing things that can have a big impact on the environmental impact but the management system is my area, setting up the management systems, making sure there are things in place to allow the improvements to happen. Making sure that we are complaint to the regulations, in the last few years, making argument to get investment to encourage things like that.”*

It also appears that that the previously, stated points help these organisations improve in the strive for GSP adoption by helping them identify/predict trends in the industry and learning new ways to be more environmentally responsible some of these trends include design of new vessel which allows for lower fuel consumption and the likely introduction of mega vessels that would reduce that is likely to change the way the shipping industry currently operates all of which have an impact of shipping emission which is a big part of GSP adoption, bunker reduction through slow steaming which has a direct impact on the emission

generated, identifying the likely benefits of GSPs adoption etc. The following quotes suggest this;

*“There are global trends in GSP and environmental protection, so we try to follow these trends and in doing so we need to read, learn and then act according to the things we have learnt.”*

*“Yes, it is a big trend; all the big shipping companies are into green shipping. The top 25 companies are already doing very well in Green shipping and the have all made remarkable achievements (Maersk, MSC, CMA). So now it is a commonly accepted practice? Yea”*

*“Yes, I think for a long time shipping, vessels did things with waste that people on land site didn’t do just because of the very nature of vessels. They have been for a long time able to get away with a lot of inappropriate actions but now things are getting tighter so you see things taking a different turn.”*

*“we can say that in shipping and in other areas of business life, sustainability is growing”*

*“We see this as a trend that is not going to disappear, it is only going to grow and become more and more demanding and the future is certainly paved in the sustainability direction”*

*“the design of modern vessels is much cleaner than they were 10 years ago so I mean a lot is being fixed at the design phase.”*

*“Yea, I think it becoming pretty much embedded in the industry now. Yea, 10 years ago no one was talking about slow steaming. They were talking about air quality, sulphur in fuel and things like that you know but not really Greenhouse gas emission. But now the leaders in shipping industry publish environmental reports every year, detailed emission reports are made public and that didn’t happen 10 years ago.”*

*“Well I think now and more so in the last couple of years, it’s just something that is seen more increasingly to be the normal thing to do,”*

*“if you are able to reduce your bunker consumption, it directly impacts your carbon emission, we actually started to do this before joining CCWG (about 4 to 5 years ago) but after joining, we do it in a more standardized manner (according to laid down rules).”*

*“I envisage that one profound advancement in the reduction of the number of vessels used with the emergence of mega vessels which are now beginning to see application on some routes and mega ports which will also emerge in the future. This will cause a shrink in the number of vessels plying the water way. With the increase in number of mega vessels, mid-size vessels will gradually disappear leaving us with smaller vessels (2500, 3000 or at the most 4000 TEUs) which will serve as feeder vessels and so I see feeder sector*

*increasing in capacity. The Mega Vessels will be able to carry more containers on the same vessels at the same time and this will reasonably reduce emission per container per TEU of the containers been transported”*

The above quote provide evidence that suggest that the case study organisations are still in the early phase of adopting GSPs. This is evident by how long they claim to have been practicing as well as their membership of professional organisations. While there is no industry specific yardstick for measuring GSPs adoption possibly due to the relatively new nature of the concept, the conceptualised elements of GSP by Lai et al, 2011 can be identified in these case studies.

#### **4.4 EVIDENCE OF GREEN SHIPPING PRACTICES**

This sections provides empirical proof for GSP adoption within the case study organisations. This helps to further demonstrate GSPs adoption and to what extent it has been implemented. This section provides evidence of what GSPs are present in the case organisations. This will help to further highlight the extent of GSPs within the chosen organisations. In order to do this, we consult the GSPs conceptualisation proposed by Lai et al 2011. This conceptualisation presents certain core element that is expected to be present within a GSP model. These elements include: Company policy and procedure (CPP), Shipping documentation (SD), Shipping equipment (SE), Shipper cooperation (SC), Shipping materials (SM), Shipping design and compliance (SDC).

##### **4.4.1 COMPANY POLICY AND PROCEDURE (CPP)**

This embodies organizational/corporate commitment to a vision. It encapsulates

the organizational culture of sustainability in a shipping firm, e.g. senior management's commitment/support for sustainability practices (Lai et al, 2011). From the case study organisations, we find evidence of CPP that indicate the presence of this GSP element. The following quotes are indicative of this:

*"We do have an environmental committee which is chaired by our CEO and they make the major decisions and then drive it from there"*

*"Well, for our company, we don't have different department for this because it is very new and we are not as big as other global shipping companies that have implemented this practice but we have a position/office that oversees this aspect and that's me. My position is Environmental Policies Specialists."*

*"In this company what we have is a person that has the responsibility of the environmental manager, we don't particularly have a department."*

*"Yea the leadership support GSP very strongly and being here in the UK at this time participating in this maritime emission reduction research project also shows their support. The fact that I am the only one overseeing this aspect of the company could have been enough reason for it to be undermined however the support has been enormous. SO they are very supportive."*

*"At the management level, I believe the entire top management level share the same opinion and support for Green Shipping."*

*“The chief executive largely supports this initiative and tries to extend it to other aspect of the business as well.”*

*“I think my perception is that they (i.e. senior management/executives) are very supportive. This company is owned by a family and it is not very common that a family company will be very developed in this aspect because it is a one-man show. So considering this company as such the support from the top is very positive.”*

*“everybody and every department has some sort of responsibility in terms of environmental aspects of their functions.”*

The above quotes clearly show that these organisations benefit from top management support which is evidence of the existence of GSPs adoption within the case study organisations. This support is seen in the form of the existence of an environmental committee which oversee such related issues as well as the extension of the desire for environmental responsibility in all aspects/departments of the business. This notion is further emphasised through the organisations’ environmental policies a portion of which is presented below:

*“Alpha Line recognises that our responsibility towards the environment goes beyond legal and regulatory requirements. We are committed to reducing our environmental impact and continually improving our environmental performance as an integral part of our business strategy and*



*operating methods, which include regular review points. We will encourage our customers, suppliers and other stakeholders to do the same.”*

*“Gamma ports recognises that all its activities interact with and have some effect upon the environment. It acknowledges that it has the responsibility to mitigate the short and long term effects of its operations upon the local, national and international environment whilst maintaining the company’s financial stability.”*

Here we see both organisations’ environmental policy clearly emphasises their commitment to being responsible for their environment even to the extent of exceeding regulatory requirements. This clearly demonstrates the presence of a supporting company policy as expected for adoption of GSPs and is indicative of the presence of CPP element of GSPs.

#### **4.4.2 SHIPPING DOCUMENTATION (SD) AND SHIPPING EQUIPMENT (SE)**

This involves documentations concerned with shipping activities e.g. booking request, booking confirmation, shipping instructions, invoice etc. (Wong et al., 2009c). Technology is increasingly being used for these functions in order to mitigate the probable negative effect of physical materials e.g. Maersk has tried to reduce the use of paper through the development of an automated “End-to-End EDI Solutions”. This has helped to simplify and synchronize data distribution across all processes and all stakeholders. Shipping equipment (SE) involve the incorporation of environmentally friendly shipping equipment and facilities. Some existing examples of these include eco-labelling of resources like shipping

crates and totes for reuse. Together these two elements emphasise the incorporation of technology and environmentally friendly materials into shipping functions hence highlighting the “Green” notion being introduced into shipping practices.

An examination of the case organisations, show a robust incorporation of technology into the operations hence helping to reduce the use of physical materials that could be potentially detrimental to the environment. Below we see operations manager emphasising the use of emails/satellite phones for communication, reports are generated and circulated electronically, scheduling and planning which would have been otherwise done manually requiring lots of drawings and paper are now done using smart electronic systems as can be seen in the following quotes:

*“-Email: Minimum ones a day or more - Satellite and Mobile phones as often as possible. Information passed include, speed decisions, daily report, cargo planning, bunker and port situations, rotations, weather.”*

*“Vessel communicators; Some vessels are equipped with online chat applications”*

*“Emails Via Satellite; information sent and received include; bunker on board, ETA for next port, ETS, daily bunker consumption, daily navigation, daily port reports. Phones; (GSM and satellite)”*

*“Scheduling Process: Vessel Scheduling is done using a system based software called ARMADA by SEA LINER. Trade department provides port rotation information. Netpas (a system based software) is used to estimate distance, fuel consumption and cost (using the daily bunker cost). Input into the Netpas program are; Speed Port days. Port charges, Consumption, Bunker price, Hire cost. Output from the program are; Total Expenditure, Slot cost = {Total voyage expenditure/Vessels effective TUE}*

*“Planning Process: Container Loading is done using a system based software called Plan Master. Agencies send total number of containers with all their specifications (weight, port of destinations, dimension, type etc.). Loading is done based on a priority rule of first to be discharged should be at the top. Other factors considered while developing the loading plan include the vessel stability and effectiveness of discharge process (containers are loaded such that more than one gang can work on the vessel at the same time). This helps to reduce time spent at port hence less fuel consumption. The vessel's shape, size and dimensions are predefined into the plan master program at installation, after this they can be used severally. There are several stability programmes (software). Each vessel has a separate stability software that is supplied by the vessel owner at the time of hiring arrangements. Stability software makes use of input such as loading plan and tank conditions to generate outputs such as draft, trim, gravity and meta-centric height (GEM) bending moment. Each vessel has specific target ranges for all the factors mentioned.”*

The above empirical proof within the case organisations help us to identify that there exists elements of SD and SE as indicated by (Wong et al., 2009c) within these organisations hence it is safe to conclude that it meets these requirements within the GSPs framework.

#### **4.4.3 SHIPPER COOPERATION (SC)**

The cooperation of shipping firms with other industry stakeholders over environmental issues is another identified dimension/element of GSPs. It is expected that this cooperation is necessary to ensure an all-inclusive process view in ensuring environmental sustainability.

The case study organisations easily fulfil this requirement. Severally during the interviews, the participants highlighted the need for collaboration and instances where they collaborate with other industry stakeholders. Some of such instances are stated below:

*“Actually all these companies are also a member of CCWG and we meet twice a year and are very familiar with each other’s practices.”*

*“I particularly think that it is the collaborative effort of all parties within and outside the shipping supply chain to ensure a more efficient transportation of goods with the least possible impact on the environment.”*

*“I think what we need to do more is to keep in touch with the global players because they have the blue prints and the future plans for maritime*

*environmental sustainability.”*

*“we are still in the learning phase (my company and I too) but becoming a member of CCWG is a big impact in trying to reduce our emission and trying to be more transparent in the operations of our vessels.”*

*“The shipping lines cannot effectively do it themselves and I am not suggesting a drastic decrease in the usage of road transportation as it is the largest producer of emission because this will mount intense pressure on the shipping lines however, there is a need for collaboration between all stakeholder to effectively tackle global environmental pollution”*

*“We are not just members; we actually play an active role.....I am also actively participating in special task force groups within CCWG that are developed to address specific issues. So we are actively involved and as matter of fact CCWG ensures that all its members are active since they are not a commercial organisation. They are a voluntary organisation so the cooperative effort of its entire member is very important.”*

*“we are a part of the ECOPORT network. It's the European seaport organisation. They have a network of the ECO ports network. There are other groups that we are involved with in the UK and wider industry sector.”*

*“Actually, there are global trends in GSP and environmental protection, so I try to follow these trends and in doing so I need to read, learn and then act*

*according to the things I have learnt. I also coordinate the relations between CCWG and my company and that about it for now.”*

From the above quotes we see the presence of collaboration which is largely emphasised here through membership of organisations that support shipping companies to fulfil their environmental responsibilities/obligations. These organisations include Clean Cargo Working Group (CCWG) which “is a business-to-business leadership initiative involving major brands, cargo carriers, and freight forwarders dedicated to reducing the environmental impacts of global goods transportation and promoting responsible shipping.” (CCWG; 2016), ECOVADIS which “aims at improving environmental and social practices of companies by leveraging the influence of global supply chains.” (ECOVADIS; 2016), ECOPORTS which “create a level playing field on port environmental management in Europe through the sharing of knowledge and experience between port professionals (ECOPORTS; 2016). Additionally, we also see the far-reaching capacity of these organisations in that they encompass not only shipping firms but also big brands/companies that frequently make use of shipping services and ports operators i.e. these organisations create a forum for and synergy between all stakeholders within the shipping supply chain. With the above proof, it can be accepted that the case study organisations demonstrate sufficient evidence of Shipping Cooperation (SC) which puts them in contact with shipping stakeholders from which they learn and improve their environmental performance in fulfilment of SC element of GSPs.

#### **4.4.4 SHIPPING MATERIALS (SM)**

This is concerned with management of used shipping material in such a way that it is recycled in an environmentally friendly manner e.g. the afterlife/recycling of vessels. The procedure ensures that hazardous materials with negative environmental impacts are removed before vessel recycling while on the other hand, new vessels are designed and built to ensure a very high recycling ratio (Lai et al, 2011).

With respect to shipping Materials the evidence available is not as robust as is obtainable for other elements of GSPs however, there is however an incline that the case study organisations still try to ensure the safe disposal of shipping waste and the upkeep of vessels. The quotes below give an indication of the effort made by these organisations to demonstrate that they pay attention to the disposal of waste and other forms of unwanted material in a way that doesn't pose a threat to the environment.

*"we collect waste from them and encourage them to reduce their noise, with respect to their emission, sometimes we go on the vessels and announce to them to do something about it"*

*"we are heavily carrying out a lot of improvements works on our vessels in order to be certified as well as meet IMO regulatory standards."*

*"The engineering department have a role to play in terms of equipment and energy consumption, facilities management, waste*

*management, operations clearly watch their impact so it's not something that is left for anyone person."*

*"we are investing in our vessels to meet the criteria set the SECA zone for CO2 emission. We are also a part of CCWG and every year we publish our results and they give their comments and recommendation as well as expectations."*

The statements above are indicative of some form of Shipping Material element of GSPs. It highlights that wastes are carefully disposed in a safe manner although how this is achieved is not specifically stated. It is also mentioned that vessels are frequently assessed and improved on to meet prevailing regulatory requirements. There is however no specific mention of how vessels are disposed of at the end of the service life, this may be due to several reasons. Firstly, it is not uncommon that shipping firms lease vessels for a limited time meaning the vessels' end of service disposal would be the responsibility of the owning company and not the leasing firm. It is also common that shipping firms sell vessels to other upcoming firms who may not be financially buoyant enough to purchase new ones in which case the responsibility of the vessel's end of service life would also be that of the firm it serves last. In this instance, it is safe to assume a partial fulfilment of the SM element of GSPs within the case study organisation. This is because the evidence available does not sufficiently lead us to a conclusion of the robust demonstration of the SM feature of GSPs.

#### **4.4.5 SHIPPING DESIGN AND COMPLIANCE (SDC)**



This is concerned with taking measures to minimize the life-cycle environmental damage of shipping activities through compliance with regulatory requirements. It covers all design aspect of shipping that ensures environmental sustainability. Maersk being very concerned with fuel consumption has developed the Voyage Efficiency System (VES) to help with fuel-efficient vessel routing.

Our case study organisations demonstrate a great deal of environmental consciousness/responsibility. Referring to the environmental policies previously quoted under the CPP section a portion of which is provided below:

*“We are committed to reducing our environmental impact and continually improving our environmental performance as an integral part of our business strategy and operating methods, which include regular review points...”*

*“It acknowledges that it has the responsibility to mitigate the short and long term effects of its operations upon the local, national and international environment”*

We see both organisations sternly acknowledging the likely impact of their operations on the environment and firmly making a resolution to be responsible for mitigating any negative impact. A further look into the environmental performance reports provided by one of the organisations (Gamma Ports) shows complimentary evidence that support the intentions stated in the policies.

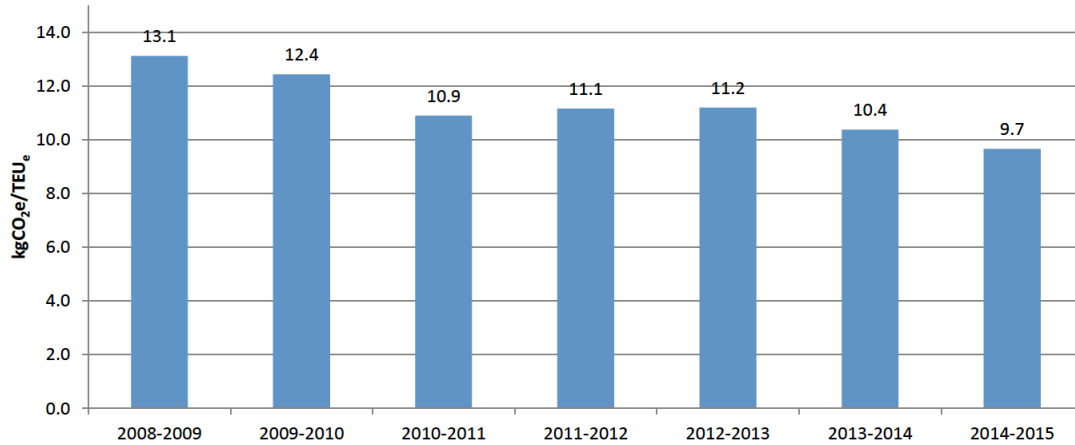


Figure 4.1 Reducing Carbon emissions (Gamma Ports, 2016)

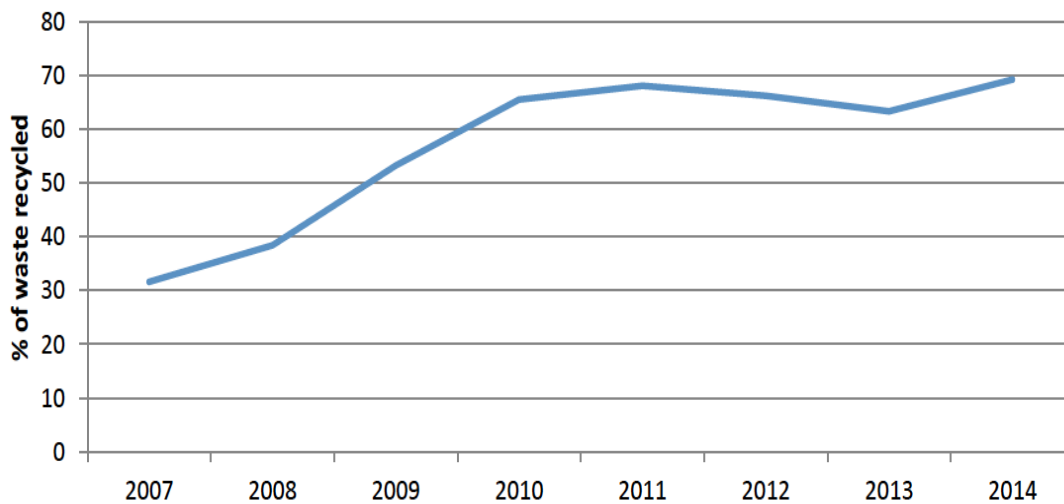


Figure 4.2 Increasing Recycling Activities (Gamma Ports, 2016)

Figures 4.1 and 4.2 above provided by Gamma ports show evidence that support their environmental sustainability claims. These graphs form a part of their annual environmental reports submitted in line with the standards of World Resources Institute (WRI) as well as those of the World Business Council for Sustainable Development (WBCSD). Figure 5.1 shows reducing values for carbon emission year over year leading up until 2014-2015. The horizontal axis shows the year on year values since 2008-2009 while the vertical axis shows the kilogram carbon emission per twenty tonnes equivalent (kgCO<sub>2</sub>e/TEU). An

analysis of the graph shows over 20% reduction in carbon emission since 2008-2009. Additionally, Figure 4.2 shows increasing recycling activities. On the vertical axis is the percentage of waste recycled while the horizontal axis shows the yearly figures. The graph shows values ending at 70% in the year 2014 meaning 70% of waste produced during shipping activities on this port is recycled. It was further gathered that in March 2015 the port achieved a record recycling percentage of 82.5%. This is a remarkable benchmark demonstrating a focussed effort at being environmentally sustainable. Similarly, the Environmental Manager of Alpha port stated that:

*“we are a member of CCWG, which is dedicated to reducing carbon emission and other forms of emissions, which have negative impact on the environment. We are also trying to reduce our fuel consumption in order to reduce our carbon footprint.”*

This highlights a conscious effort to minimise negative impact of their shipping activities. Furthermore, both organisations clearly acknowledge the presence of some form of regulatory influence, as well as their commitment to adhere hence ensuring that the negative impact of their organisations are properly managed. This is evidence from the quotes below:

*“we are ISO140001 and ISO500001 certified so we are mandated to set objectives and targets and monitor ourselves against them”*

*“In addition to these, there are several other regulations and restrictions that we adhere to.”*

*“there are a huge number of environmental regulations that we have to follow as a business and it covers everything, from voyages to GHG to biodiversity, it covers everything and anything you can think off”*

It is also interesting to see these organisations exploring vessel design options as part of the near future measure for limiting negative environmental impact of their operations. The quotes below highlight the proactive nature of these organisations at exploring better long lasting solutions to the environmental impact of their operations.

*“In addition to this the future will see the introduction of new generation and more efficient engines, research into cleaner fuels, alternative ways to power vessels (solar, wind etc.) and other options, will also result in a reasonable reduction in the use of fossil fuels as well as reduction of number of vessels used which will ultimately impact on emission.”*

*“the emergence of mega vessels which are now beginning to see application on some routes and mega ports which will also emerge in the future”*

*“we are heavily carrying out a lot of improvements works on our vessels in order to be certified as well as meet IMO regulatory standards.”*

These statements indicate the intentions of these organisations to explore more long lasting solution to the impact of their shipping activities on the environment. It is suggested here that newer vessels will be likely powered by cleaner fuels hence less emissions. It is also anticipated that mega vessels will

likely replace the existing ones and will have more efficient engines hence energy consumption will be better managed leading to less negative impact on the environment. Having considered the pointers required to demonstrate Shipping Design and Compliance which respect taking measures to minimize the life-cycle environmental damage of shipping activities through compliance with regulatory requirements. We can conclude that this feature of GSPs is duly satisfied within the case organisations.

#### **4.5 MONITORING, REPORTING AND PERFORMANCE OF GREEN SHIPPING ACTIVITIES**

This section examines evidence relating to environmental performance of the case study organisations. This evidence is intended to highlight how environmental performance is monitored and the performance of these organisations within the time frame of the reports made available. These reports are further complimented by quotes from the interviews conducted. The quotes presented in this section are mostly from interviews with the environmental managers of these firms specifically as they are largely responsible for the activities being examined in this section hence not many quotes are available however the evidence presented is sufficient for analytical purpose as it is complimented with self-appraised performance reports as well as from audits carried out by reputable organisations.

#### 4.5.1 ALPHA SHIPPING PERFORMANCE REPORTS

Gatherings from the interview with the environmental manager for alpha shipping indicate that monitoring and reporting of environmental performance is keenly done. This is evident in the following quotes.

*“For our organisation, we report annually but we also publish an environmental report on our website every as well.”*



*“We have only reported our performance twice, and our CO<sub>2</sub> emission has improved by about 3% and we also calculate our performance in house and from 2011 to 2015 we have made a 12.5% improvement in 4.5 years.”*

*“Yes, we set targets, and in fact it is one of the rules of CCWG, you need to set targets and try to achieve them. Our target is to achieve 20% reduction by 2020.”*

*“We have specific and standard ways of measuring our environmental performance. It is usually filled after every voyage. Each vessel completes these standardized sheets and we monitor our fuel consumption, distances and all operational specifications of the voyage and then we report to CCWG and they calculate according to IMO and other regulations and they give us our score.”*

From the quotes, it can be observed that monitoring of performance is done annually both externally and internally. External audits are done by CCWG which

mandates that environmental reports be submitted annually and the appraisal is done in line with global standardization. Internal audits are carried out through a compilation of individual journey reports which highlights vessel fuel consumption, distances and all operational specifications of the voyage. It can also be observed that targets are set for which the organisation strives to meet through optimization of its operations/more efficient use of energy. The willingness of the organisations to subject itself to such rigorous routine of annual internal and external audits can suggest a willing to improve its environmental performance. This appears to be paying off as a self-reported assessment indicates a 12.5% improvement in performance over four years of monitoring. Below, complimentary evidence/report of a two year on year summary of total environmental performance from CCWG is examined to ascertain the progress of Alpha line with respect to environmental performance REF.

Carrier Scores (2013)							
Carrier	Carrier CO2 Scores (Max 40)	Carrier SOx Scores (Max 20)	Carrier NOx Scores (Max 10)	Carrier EMS Scores (Max 10)	Carrier Waste, Water & Chemical Scores (Max 10)	Carrier Transparency Scores (Max 10)	Carrier Scores
Arkas Container Transport S.A. (Arkas)	20.00	10.00	1.24	0.00	4.60	0.00	35.84

SOx, NOx, EMS Transparency (2013) :: Arkas Container Transport S.A. (Arkas)		
	Carrier Data	CCWG Baseline
SOx Emissions		
% Fleet-wide Average Sulfur Content of Fuel	2.27	2.28
NOx Emissions		
Post-1999 Fleet-wide Average Performance Against IMO curve (% below IMO curve)	18.78	11.26
NOx Emissions		
% of reported vessels included in NOx carrier score calculation	42.11	N/A
Environmental Management Systems		
% of Fleet with Certified EMS	0.00	N/A
Transparency (Core Questions)		
	Indicator	Source
Public reporting on annual CO2 emissions from operations?	No	
Public reporting on environmental goals/targets ?	No	
Public description of policies/programs on the management of environmental impacts?	No	
Public description of initiatives to use renewable energy sources and increase energy efficiency?	No	
Public disclosure of breakdown of fleet composition	No	
Transparency (Additional Questions)		
	Indicator	Source
Public reporting on charter partners' environmental impacts	No	
Public reporting on initiatives to influence charter partners' environmental impacts	No	
Public description of initiatives to control urban air emissions	No	
Public description of initiatives to control traffic congestion, and noise in relation to road transport	No	
Public description of environmental impact of major infrastructure assets (railways, real estate)	No	

Figure 4.3 Summary of Alpha Line CCWG Environmental Performance Report for Year 2013 (Alpha Line, 2013)

**Carrier Scores (2014)**

Carrier	Carrier CO <sub>2</sub> Scores (Max 40)	Carrier SO <sub>x</sub> Scores (Max 20)	Carrier NO <sub>x</sub> Scores (Max 10)	Carrier EMS Scores (Max 10)	Carrier Waste, Water & Chemical Scores (Max 10)	Carrier Transparency Scores (Max 10)	Carrier Scores
Arkas Container Transport S.A. (Arkas)	20.00	10.00	1.62	0.00	6.50	5.00	43.12

**SO<sub>x</sub>, NO<sub>x</sub>, EMS Transparency (2014) :: Arkas Container Transport S.A. (Arkas)**

	Carrier Data	CCWG Baseline
SO <sub>x</sub> Emissions	2.44	2.27
% Fleet-wide Average Sulfur Content of Fuel		
NO <sub>x</sub> Emissions	19.01	12.55
Post-1999 Fleet-wide Average Performance Against IMO curve (% below IMO curve)		
NO <sub>x</sub> Emissions	50.00	N/A
% of reported vessels included in NO <sub>x</sub> carrier score calculation		
Environmental Management Systems	0.00	N/A
% of Fleet with Certified EMS		
Transparency (Core Questions)		Source
Public reporting on annual CO <sub>2</sub> emissions from operations?	Yes	<a href="http://www.arkasline.com.tr/en/sustainability2.html">http://www.arkasline.com.tr/en/sustainability2.html</a> and Annual Report
Public reporting on environmental goals/targets?	Yes	<a href="http://www.arkasline.com.tr/en/sustainability2.html">http://www.arkasline.com.tr/en/sustainability2.html</a>
Public description of policies/programs on the management of environmental impacts?	Yes	<a href="http://www.arkasline.com.tr/en/sustainability2.html">http://www.arkasline.com.tr/en/sustainability2.html</a>
Public description of initiatives to use renewable energy sources and increase energy efficiency?	Yes	<a href="http://www.arkasline.com.tr/en/sustainability2.html">http://www.arkasline.com.tr/en/sustainability2.html</a>
Public disclosure of breakdown of fleet composition	Yes	Annual Report
Transparency (Additional Questions)		Source
Public reporting on charter partners' environmental impacts	No	
Public reporting on initiatives to influence charter partners' environmental impacts	No	
Public description of initiatives to control urban air emissions	No	
Public description of initiatives to control traffic congestion, and noise in relation to road transport	No	
Public description of environmental impact of major infrastructure assets (railways, real estate)	No	

Figure 4.4 Summary of Alpha Line CCWG Environmental Performance Report for Year 2014 (Alpha Line, 2014).

From the two figures presented above, drawing attention to the top sections of the images (Carriers Scores section), we see the elements being assessed and scoring criteria (carbon emission (CO<sub>2</sub>), Nitrogen emissions (NO<sub>x</sub>), Sulphur emission (SO<sub>x</sub>), Environmental Management Systems (EMS), Carrier Waste, Water and Chemical Scores, Carrier Transparency Scores). These elements have been presented in the table below for clarity (Alpha Line, 2014).

Table 4.1 Table of Emission volume and percentage for year 2013 and 2014

MEASUREMENT FACTORS/MARKS AWARDED	Year 2013	% of Overall Marks	Year 2014	% of Overall Marks	2013- 2014 % Change
Carbon emission (CO <sub>2</sub> ) – 40	20	50%	20	50%	0



Sulphur emission (SO <sub>x</sub> ) - 20	10	50%	10	50%	0
Nitrogen emissions (NO <sub>x</sub> ) - 10	1.24	12%	1.62	16%	4%
Environmental Management Systems (EMS) - 10	0	0	0	0	0
Carrier Waste, Water & Chemical Scores -10	4.6	46%	6.5	65%	19.00%
Carrier Transparency Scores - 10	0	0	5	50%	50.0%
<b>TOTAL (100)</b>	<b>35.84</b>	<b>36%</b>	<b>43.12</b>	<b>43%</b>	<b>7.00%</b>

(Alpha Line, 2014)

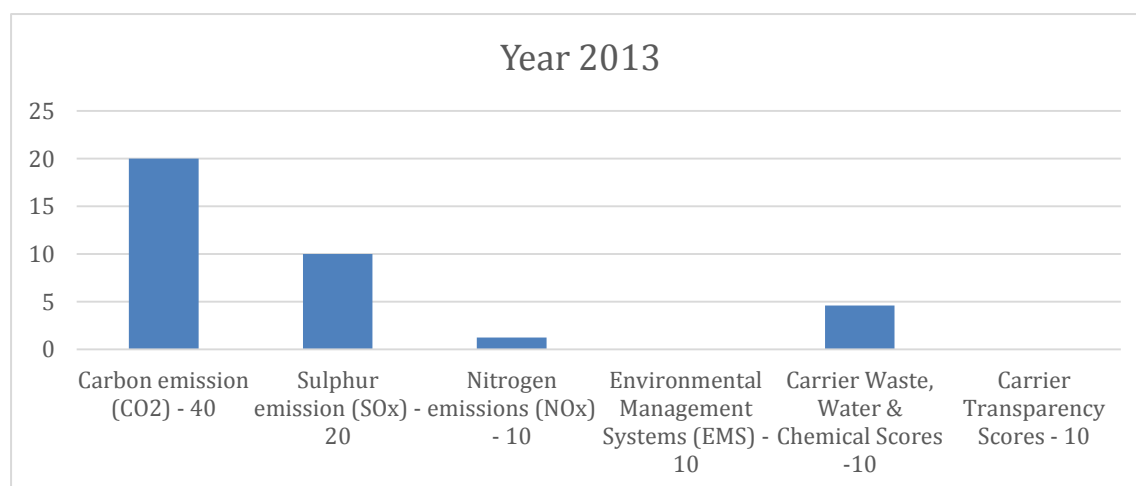


Figure 4.5: Emission volume and percentage for year 2013 (Alpha Line 2013)

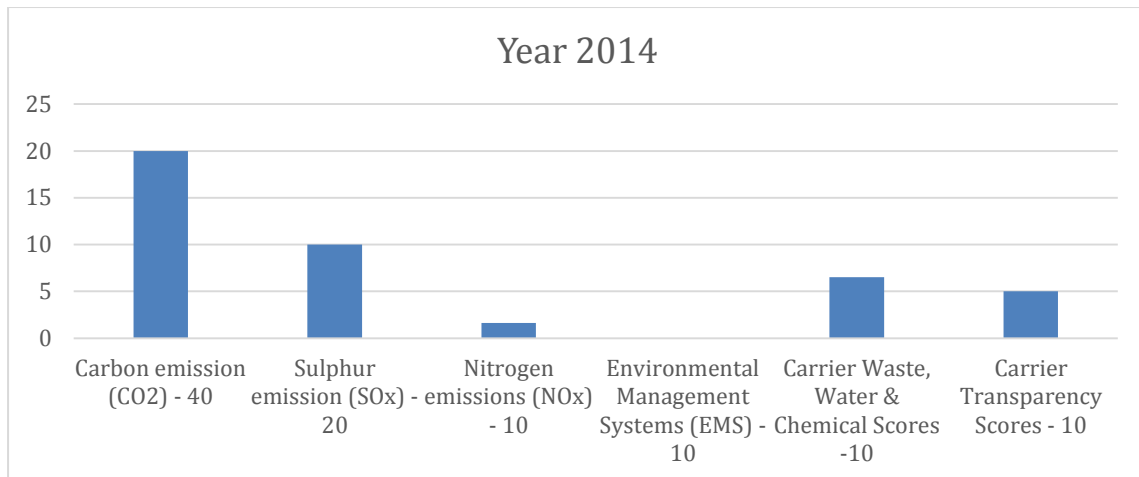


Figure 4.6: Emission volume and percentage for year 2014 (Alpha Line 2013)

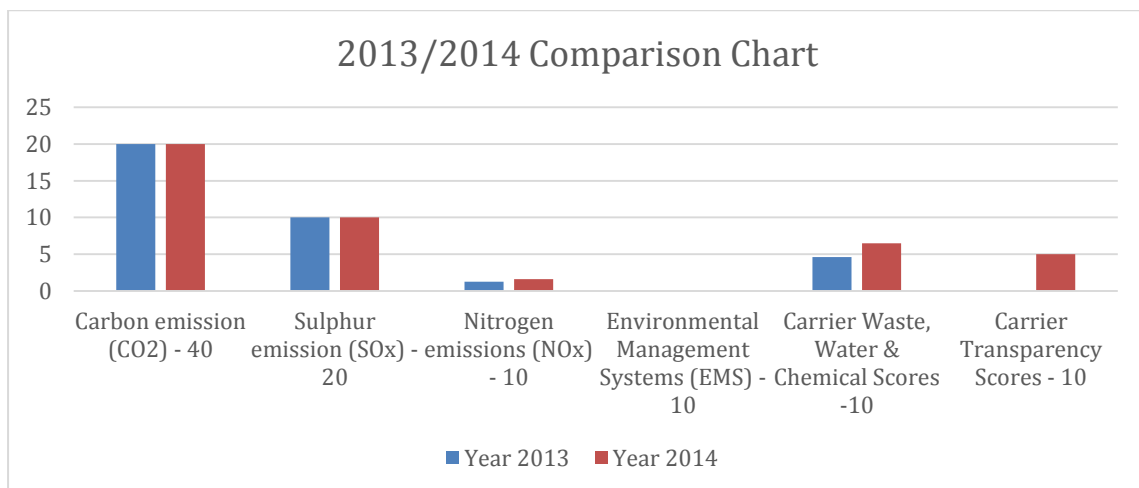


Figure 4.7: Emission volume and percentage comparison for year 2013 and 2014 (Alpha Line 2013 and 2014).

The set of figures presented above, certain points can be deduced as follows;

1. A 4% increase in the score for Nitrogen emissions (NO<sub>x</sub>) from 1.24 to 1.62.
2. A 19% increase in the Carrier Waste, Water & Chemical Scores.
3. A 50% increase in the Carrier Transparency Scores.
4. A 7% increase in the aggregate score from 35.84 to 43.12.

While there were no changes in the score for carbon and Sulphur emissions, the observed improvement is worthy of an accolade. The three areas where

improvements were noticed (Nitrogen emissions, Waste, Water & Chemical and Transparency) form a critical part of GSPs framework. Putting into consideration that GSP adoption is just under three years in the case organisations, the improvements suggest an intensive effort on the part of the organisation to improve its environmental performance. The noticed indifference in the carbon and sulphur emission may be due to fuel quality. Carbon and Sulphur are both elements found in the shipping fuel and the organisation may not have much control over their carbon and sulphur content of the fuel. The alternative would be to buy higher quality fuel which would in no doubt be more expensive and considering that fuel cost is about the biggest cost for shipping firms, this may not be an immediate option. It is however notable to see such good improvement within a short time.

#### **4.5.2 GAMMA PORTS PERFORMANCE REPORTS**

In this section, we examine similar evidence as was examined in the previous section to see how environmental performance is monitored in Gamma Ports. The following quotes from the Environmental Manager and Ship Operations Managers of Gamma Ports below demonstrate the organisations' effort to improving their environmental performance through monitoring and reporting.

*"Yea, we set objectives and target every year and it is reviewed by the environmental committee"*

*“we are ISO140001 and ISO500001 certified so we are mandated to set objectives and targets and monitor ourselves against them...we are also externally, audited to ensure those standards each year as well.”*

*“Well yea, one of the key ones in fact for a few years is that we are striving for a 30% reduction in our carbon intensity that is to reduce our CO2 emission per TEU and at the moment we’re about 26.4% from where we started so we’re making good progress and that is just one of them, we also have objectives and targets for sulphur dioxide which is about 18% and Nitrogen dioxide which is about 20% so we monitor all these things continually to drive them down”*

*I think we can achieve it and from my opinion I think we can surpass it.*

The quotes above show that Gamma Ports just like the Alpha Shipping Line makes use of similar techniques/methods to carry out their monitoring and reporting activities. This is observed to be through setting targets, internal and external audits and professional accreditation. There is also an inclination of a keenness on the part of the organisation to be more environmentally friendly which is suggested by the level of optimism expressed by the environmental manager as seen in the last quote above. The figures below give even greater insights into how Gamma port is doing.

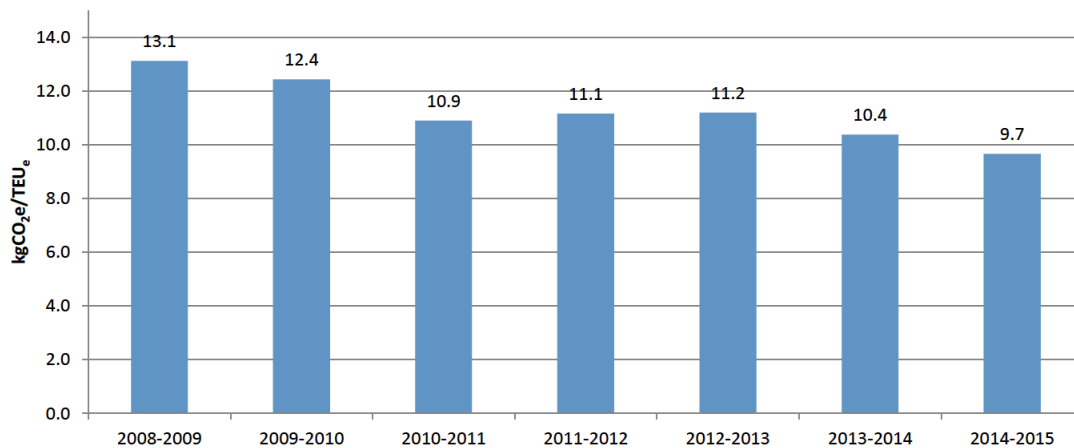


Figure 4.8 Reducing Carbon emissions (Gamma Ports, 2016)

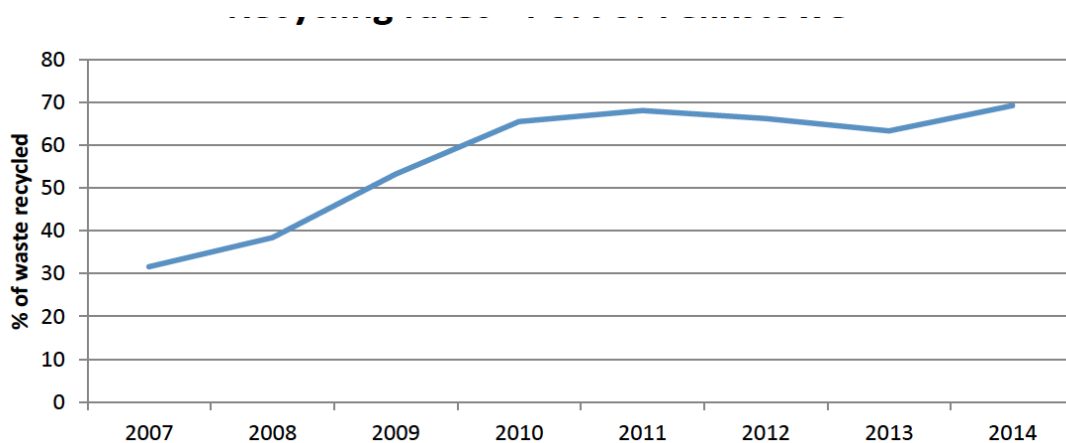


Figure 4.9 Increasing Recycling Activities (Gamma Ports, 2016)

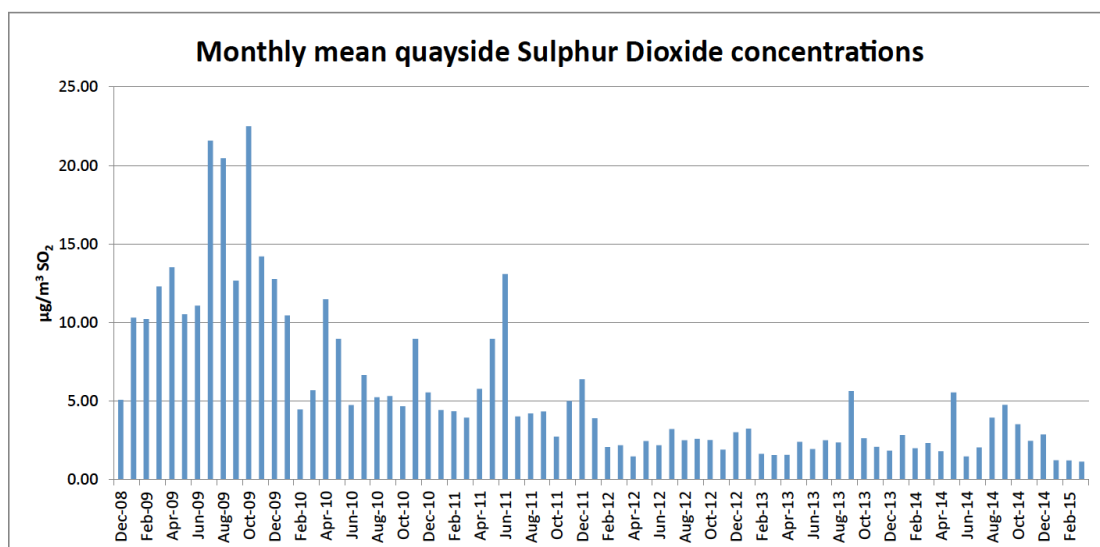


Figure 4.10 Decreasing SO<sub>2</sub> concentration (Gamma Ports, 2016).

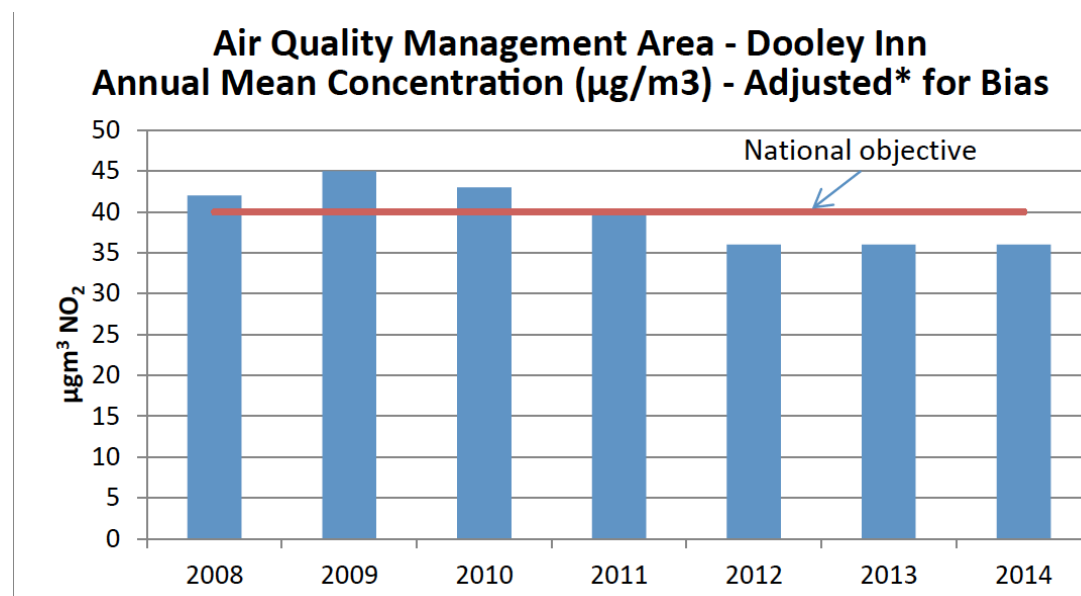


Figure 4.11 Improving Air Quality (Gamma Ports, 2016)

From the Graphs presented above, the following points can be observed.

1. Gamma Ports achieved about 26% decrease in carbon emission from 2008 to 2015.
2. Gamma Ports achieved about 40% increase in recycling between 2007 to 2015
3. Gamma Ports achieved about 91% decrease in Sulphur dioxide concentrations from the highest recorded figures in 2009.
4. Gamma Ports currently have Air Quality level that is about 10% better than the National average.

The above statistics indicate that monitoring, reporting and performance are quite taken seriously in Gamma ports. A comparison of both cases reveals that similar techniques are used for these activities. Additionally, it is observed that Gamma ports appear to have more statistical evidence available compared to

Alpha line. This can be explained by self-reported time of GSPs adoption. Alpha port is said to have begun GSPs adoption just under three years ago hence the statistic available only cover about three years. Gamma ports on the other hand seem to have statistics that span up to seven years indicating a longer time in the GSPs. Another plausible reason for this is the difference in context. Alpha Line is a located Turkey while Gamma ports is in the United Kingdom. It appears that this difference in context does influence the level/extent of environmental activity being carried out. One of the Alpha line operations managers emphatically stated that *“Generally, being green is not a common business culture in Turkey”* (Alpha Line., 2016). Complimentary statements were also made indicating that Europe has a better Green/sustainability culture: *“I believe there are smaller regional carriers that are doing well too and I reckon they would be from northern Europe where being green is in the business culture and is a part their business life”*. This idea that context can be a cause for variation is also indicated in literature where

#### **4.6 THE PROACTIVE OR REACTIVE APPROACH TO GREEN SHIPPING PRACTICES ADOPTION**

This section presents evidence that demonstrate how GSPs is being adopted. Two contracting themes are being explored here (proactive & reactive). By proactive approach to GSPs, the research aims to identify patterns that suggest a self/intuitive approach by shipping firms to adopt environmentally friendly practices while in contrast a reactive approach to GSPs would suggest that GSPs adoption by shipping firms is merely a response on the part of shipping firms to some form of influence/pressure from within or outside of the organisation. The

findings of this research suggest that GSP adoption is a result of a combination of both proactive and reactive elements. It is further inferred from the interview responses that it may have begun as a reactive process but has now progressed as a proactive effort which is now responsible for most of the GSPs related activities embarked on. The quotes below provide evidence that suggest that GSPs adoption is both a proactive and reactive approach.

*"I believe it is both a reactive and proactive approach"*

*"I think we started with "we have to do it" but now seeing the global trends it is now a welcome idea and we are all happy to carry on doing it."*

*"I'll say it a mix, some are proactive but it's usually driven by something else"*

*"I think we started with personal reasons and future of the world, I think it is now a welcome idea and we are all happy to carry on doing it."*

*"It started as a reactive process but now it is proactive because we cannot we ignore what is happening globally."*

*"If we ignore the realities, we will be out of business. In fact, we have to keep up with the changing regulations in order not to be caught unprepared."*



#### 4.6.1 THE REACTIVE APPROACH TO GREEN SHIPPING PRACTICES ADOPTION

It can be further gathered that the reactive nature of GSPs adoption may have been driven by regulatory influence and customer demands which imposed responsibility on the organisation to become more environmentally responsible. (DiMaggio & Powell, 1983 stated that “Coercive isomorphism translates to pressures from entities upon which firms/organizations depend for resources”. In this instance there is evidence to suggest that these shipping firms began to imbibe the idea of GSPs due to pressure from customers and regulatory influences;

*“we have customers that are placing demands for us to be environmentally responsible”*

*“regulatory bodies are quite strict and when sanctions are imposed it could be really detrimental...”*

*“Actually, I believe it is both a reactive and proactive approach because we have customers that are placing demands for us to be environmentally responsible but also our efforts to reduce our carbon emissions also means cost savings on our part.”*

*I think the reason why this change is coming in the shipping industry is because further away from the personal reasons and future of the world, I*

*think it is pressure coming from the clients (global brands) due to globalization.*

Another factor that was seen to influence a reactive approach to GSPs was the price of Oil. Some of the participants emphatically stated that;

*“For instance, in the past few years, the common practice was slow steaming but that can be said to be driven by high oil prices”*

*“if we’re looking at it from an environmental perspective, it really doesn’t matter what the driver is, so high oil prices are probably good for the environment.”*

*“if you use less fuel, you make more money but it sometimes takes things like really high oil prices get people’s attention”*

This gives an incline that increased oil prices could have also been an influence and shipping firms taught it wise to respond by being more environmentally responsible in their processes. This is further complimented by other comments that highlighted that GSPs actually helps the company save money:

*“our efforts to reduce our carbon emissions also means cost savings on our part. In the shipping industry, the main cost is the vessel rent and bunker consumption, if you are able to reduce your bunker consumption, it directly impacts your carbon emission, we actually started to do this before joining*

*CCWG (about 4 to 5 years ago) but after joining, we do it in a more standardized manner (according to laid down rules)."*

*"Well, I think that and for lack of a better term, to be a green business, you're actually being more efficient, you will be a better busy anyway,"*

#### **4.6.2 THE PROACTIVE APPROACH TO GREEN SHIPPING PRACTICES ADOPTION**

The idea that firms only behave in an opportunistic has been previous dispelled in literature as evidence exist of voluntary green initiatives carried out by firms (sharfman et al (1997), Prakash and Kollman (2004). This voluntariness can be likened to a proactive approach. The intention in this section is to examine evidence that might help conclude on the proactive efforts on the part of the case organisation. There exists evidence that suggest that the previously discussed approach (reactive approach) has however been overtaken by a realisation on the part of these organisations of the benefits accrued by the adoption of GSPs hence the adoption of GSPs may now be seen as proactive. The following quotes validate this submission:

*I think we are ahead of many companies being very involved in sustainability platforms. I believe there are smaller regional carriers that are doing well too*

*“The way this company is taking shipping sustainability is way ahead of the impact/concern of the government.”*

*“what you would however agree is that’s it’s nice thing to do”*

*“We are way ahead of the regulatory requirements of this country with respect to the said topic.”*

*“a moral commitment to the world at large.”*

This section has provided evidence that help to conclude that the adoption of GSPs may have begun as a reactive approach. This appears to have been driven by customer, regulatory and economic pressures that imposed constraints on shipping firms. This in turn forced them to look for better ways to functions through slow steaming and improvement in their processes. It can however also be seen that the present status of GSPs adoption is more proactive. Shipping firms now appear to go above the regulatory requirements in their pursuit of GSP implementation hence demonstrating a proactive approach. This is largely due to the realisation of the benefits that accrue from being a more efficient business which arise from GSPs adoption.

#### **4.7 DRIVERS AND ENHANCERS OF GREEN SHIPPING PRACTICES ADOPTION**

In this section, the research examines factors that appear to drive GSPs adoption, it examines the possible influence of institutional forces as a driver/enhancer for GSPs adoption. The subsections below are divided and analysed based on factors

that have been identified as drivers hence directly resulting in/influencing the adoption of GSPs and enhancers which are factors that have been identified to not exact as much direct influence however does support the adoption of GSPs. This research identified two major drivers namely; customers and professionalism through membership of professional institutions to be the drivers of GSPs. The enhancers of GSPs adoption were found to be competitor influence, leadership/managerial support and moral conviction. Regulatory influence was found to be both a driver and enhancer depending on the how effective regulatory authorities were in enforcing adherence. The sections below discuss in detail these drivers and enhancers.

### **DRIVERS OF GREEN SHIPPING PRACTICES ADOPTION**

This section discusses the drivers of Green Shipping Practices as revealed from the data collection process. Two main drivers have been identified (Customer influence and Professionalism). These drivers are discussed in detail. Some quotes from the participants have been included to further highlight the strength of the discussion.

#### **4.7.1.1 Customer influence as driver for Green Shipping Practices Adoption**

This section of the work examines the possibility of customer pressures as a driver for GSPs. There has been previous work in this area like Evangelista, (2014) who found customer initiatives as one of the drivers for GPA amongst thirds party logistic companies (3PLs) in Italy. Similarly, Hoejmose et al, (2014) studied the factors driving the adoption of coercive or cooperative GSCM practices and found customer demands to exact coercive influence on

organisation. Keui et al (2015), Har, Abdul and Nee (2013) and Etzion (2017) all arrived at similar results. Interestingly, there are also researches that indicate contrary opinions (Chou, Chen and Wang (2012) Lin and Ho (2011)) who find little customer pressures and no significant correlation between customer pressures and GPA. In this research customer pressures have been anticipated to have possible coercive influence. The data below will be examined to see if and how this influences the adoption of GSPs.

*“customers do ask about our environmental certifications, management systems you know, how we handle their waste Errmm, some of our largest customers send us audits every three years, things to do with waste handling so increasingly there are external pressures to go in that direction It would have to really be customers, when they say it then we have to comply”*

*“we see the big companies and globally recognised brands particularly from developed regions of the world, those that shipping thousands of containers enforcing and placing demands on shipping companies to adhere to environmental regulations (e.g. SECA) in order to secure their business or that you can show a continuous plan for your CO<sub>2</sub> emission reduction and that you’re are continuously investing and you can show proof and there are platforms that oversee environmental activities as this such as CCWG and ECOVADIS”*

*“Yes, some of them are and in fact the bigger the customers the more their level of awareness. They are actually leaders in the industry with things like GSPs.”*

*"we have customers that are placing demands for us to be environmentally responsible. The biggest pressure is from our customers,"*

*"Yes, they are. Most of them are aware of GSPs and actually they want you to see proof of this either through membership of environmental organizations or through records of environmental performance. They even request to see their own environmental performance e.g. one of the major automotive companies (FIAT) would usually request to see ours and their own environmental performance. So for instance if they loaded 20,000 containers with us that year, they would want to know their environmental impact while we transport their cargo and we report to them their carbon footprint each year."*

*"Yes, they demand for it, sometimes they make it is mandatory that we must have proof of environmental responsibility (either through environmental impact records or membership of environmental organisations) as an organization before entering into any business relationship with us."*

*"Yes, customer influence our decision to adopt and implement GSP. In fact, it is one of the biggest influences for us because we desire to remain in business with these customers as well as be able to compete with other global competitors."*

*"the main motivation is from the customer."*

*"Yes, some of them demand strongly while other are mild. About 25% to 30% demand strongly for environmental accountability. About another 25% are quite*

*uninterested and the middle 40% to 50% probably just ask to meet the business requirements.”*

From the above, there are strong indications that customer influence is one of the greatest drivers of GSP adoption. This influence is observed to manifest mainly in two ways: through demands placed on shipping firms to be environmentally responsible and offering incentives for proven environmental responsibility. The former is observed to play out when customers demand for proof of continuous investment in improving environmental capability, requesting to see the environmental impact/carbon footprint of their cargo, performing environmental audits, making enquiries about waste disposal and environmental management systems in place etc. while the latter usually occurs by preferential considerations being given to firms that show proof of their improving environmental activities during contract bidding process. The increasing pressure from customer appears to be as a result of increased customer awareness in fact Gamma Ports Environmental manager highlighted that customers' attention has reasonably shifted from lower cost to social and environmental responsibility hence they require shipping firms to demonstrate a great deal of ongoing/continuous dedication to improving environmental capabilities. This idea is also complimented by Alpha port's Environmental Manager when he highlighted that customer awareness largely influences the drive towards GSP adoption *“Most of them are aware of GSPs and actually they want you to see proof of this”*. Another interesting thing to note from the interviews is that the bigger the customer, the greater the level of awareness hence the greater the pressure they exact. Gamma Ports Environmental manager



was able to provide insight into why this is so as he noted that bigger brands are more likely to have social responsibility and sustainability engrained in their business processes hence will ask questions if you happen to have poor environmental reports. Finally, the evidence clearly shows why customers exact such great influence on shipping firms' decision to adopt GSP. This is made obvious from the following quote: *"we see the big companies and globally recognised brands particularly from developed regions of the world, those that shipping thousands of containers enforcing and placing demands on shipping companies to adhere to environmental regulations (e.g. SECA) in order to secure their business", "it is one of the biggest influences for us because we desire to remain in business with these customers as well as be able to compete with other global competitors.", "It would have to really be customers, when they say it then we have to comply."* It is interesting to see that being able to remain in business with existing customer as well as increased prospect of newer customers is the prevailing reason for GSP adoption. This suggest that GSPs may reasonably be a financially driven action as indicated by the interviews. Away from this however, the evidence overwhelmingly suggests that customers are one of the greatest drivers of GSPs adoption. They exact two types of influences on shipping firms; a hard/coercive influence through demands for environmental responsibility and a soft/incentive influence through preferential considerations which serves as an encouragement for shipping firms to pursue environmentally responsible actions.

The above data analysis confirm that customer influence does contribute to GSPs adoption. This research pitches its tent with Keui et al (2015); Har, Abdul and

Nee (2013); Etzion (2007); Evangelista P, (2014) and Hoejmose et al, (2014) whom have all had similar result in GPA in other industry sectors (GSCM etc.). It disagrees with the findings of Chou, Chen and Wang (2012) and Lin and Ho (2011) as the evidence strongly indicate the influence of customer pressures as a coercive pressure and customer incentives as a supporting/enhancing influence on GSP adoption. This study extends research particularly Green Shipping literature by demonstrating that customer coercive pressures and supportive incentives as has been found in other research can also influence GSPs adoption.

#### **4.7.1.2 Professionalism as a Driver for Green Shipping Practices Adoption**

Professionalism is one of the normative influences identified from institutional theory to influence organisational behaviour. Institutional theory posits that Normative isomorphism arise from firms having to follow standards and/or practices as established by certified organizations (certification and training methods, professional networks etc.,) (DiMaggio & Powell, 1983). Their theory also identified two sources of normative pressure namely; formal education and growth of professional network of personnel within an organization. Tate et al (2010) highlighted the importance of Professionals in the implementation of Environmental initiatives in Supply Chain Management; Zhu and Sarkis (2007) also found that professional groups have been instrumental in promoting environmental initiatives among Chinese Manufacturing firms.

*“Yea me personally, Yes I am. “*

*"I would say not a lot but the parent company does set a policy and we do have to follow it as well."*

*"Errmm, Yea, it is part of the ECOPORT network. Itit the European seaport organisation. They have a network of the ECO ports network. There are other groups that we are involved with in the UK and wider industry sector."*

*"Yea, yea, definitely, it supports it really."*

*The ECOPORTS do, they have a lot of certifications, but we use ISO140001 and ISO500001, (The International Standards Organisation) so our management systems are aligned to those standards.*

*"Hmmm...I think it does drive because Errmm you need to demonstrate that you're doing what you said you would do so each year, you will have to demonstrate that you are meeting the objectives and target and these are usually checked to ensure that we have done it unless our compliance would need to improve."*

*"So would you say that your years of experience in addition to your being educated in environmental sector, is this complimentary to your job and does it add value or influence your perception and responsibility as an environmental manage? Yea, absolutely."*

*"So you would say you function a lot better haven been educated in this area. Yes, Yea, I would definitely agree."*

*"Firstly, we are a member of CCWG, which is dedicated to reducing carbon emission and other forms of emissions, which have negative impact on the environment. We are also trying to reduce our fuel consumption in order to reduce our carbon footprint."*

*"becoming a member of CCWG is a big impact in trying to reduce our emission and trying to be more transparent in the operations of our vessels."*

*"Yea, CCWG is one of them and there are others but we participate in other environmental organizations (ECOVADIS), which are also a partner to CCWG, and they are trying to standardize the reporting of environmental performance."*

*"Yes. It does influence our organizational perception to adopt and implement GSP. It widens our knowledge as we relate with other member organizations and this further strengthens our decision to implement GSP."*

*"Not certifications, but I have been trained as an Environmental Specialist CCWG, ECOVADIS."*

*"We are not just members; we actually play an active role. I attend board meetings on behalf of my company twice a year and also we communicate monthly meeting online (Skype, email, etc.) and I am also actively participating in special task force groups within CCWG that are developed to address specific issues. So we are actively involved and as matter of fact CCWG ensures that all its members are*

*active since they are not a commercial organisation. They are a voluntary organisation so the cooperative effort of its entire member is very important.”*

*“the popular idea would be indifferent and so the idea would have to be learned. Hence it can be said that being green isn’t particularly driven by the work force however when they learn the idea then they can further drive it.”*

*“I would say Yes it does because the more we get involved the more you see and understand and consider what needs to be done and implemented. The more exposure we get, it changes the way we think and act. People had been raising concerns about environment issues but now they are beginning to gain attention. I do hope that we can act quickly enough to remedy that situation.”*

*“Not yet but I think it is in the plans of the company to acquire these certifications. And I think it will be a good way to show proof of our environmental efforts.”*

The effect of professionalism as an influence on GSPs adoption from the above appears to play out in a very interesting manner. The data revealed that professionalism appears to exist in three main dimensions and on two levels. It can be argued that this may be the first time that such a pattern is observed. The three dimensions of professionalism manifest through organisational professional affiliations and Certifications also at the organisational level. The third dimension is through environmentally related education and years of work experience which played out mainly at an individual level. The interviews showed that both case organisations were members of professional bodies that focused on environmental sustainability issues. Both organisations also had

some form of certification (ISO140001 and ISO500001) related to environmental issues. The studies further showed that professionalism had two types of influence on GSPs adoption: a coercive influence which exists due to regulations and targets set by these affiliated and certified institutions which shipping firms need to adhere to and meet in order to continue being members. This imposes coercive pressures on shipping firms as they are required to abide by the set regulations to attain some form of legitimacy. This finding is particularly insightful as from previous studies, professionalism would usually have a normative effect. There is not much indication here that the effect is normative as the respondent emphasized the stringent need for adherence as a requirement for continued participation in membership. One likely explanation for this is the size and prowess of these professional institutions. These institutions are all well renowned whose influence span across the globe. Members include some of the biggest brands worldwide hence the possibly amplified image/authority which helps them exact such great regulatory prowess as would be typical of governments. This finding is of great interest as the understanding that size and strength of professional institutions can transform their typical normative influence into a coercive one can be very useful. This knowledge can assist in relations between governments and professional institutions giving rise to instances where the government can delegate some regulatory powers to these institutions using them to enforce their interest since these professional bodies already wield such great influence. This approach may make it easier to diffuse regulations as the usual scuffle between government and corporations would have been avoided. The other form of influence played out both at the organisational level and at an individual

level. This influence can be considered to be a supportive/enhancing influence which unlike the coercive one, does not impose any requirements. At the organisational level, it tends to create an enabling environment and opportunity for shipping firms to relate with other industry stakeholders which enhances GSPs learning. This appears to be very helpful for shipping firms as it advances their knowledge of environmental issues and in turn enables GSPs adoption. This is clear from statements like: *"It does influence our organisational perception to adopt and implement GSP. It widens our knowledge as we relate with other member organisations and this further strengthens our decision to implement GSP."* At the individual level, it was observed that the operation manager interviewed particularly the environmental managers had some form of formal education in environmentally related areas. This coupled with years of industry experience (easily above five years) appeared to have positively influenced GSPs adoption. The responses of the participants indicate that having had some form of environmentally related studies influenced their perception hence adoption of GSPs. The understanding of the different dimensions and levels of professional influence is a profound contribution to shipping literature. This manner of relationship has not been previously identified in literature as the dearth in shipping literature coupled a lack of understanding of the drivers of GSPs has been previously noted (Lai et al (2011); Lun et al (2008)). Practically, understanding that the desire for legitimacy duly met by professional affiliations and certifications has been effective in driving and enabling GSPs provide regulatory bodies with a clue on how similar institutional infrastructures can be used to drive similar ideas. Additionally, seeing the enabling effect of environmentally related formal education can foster better collaboration

between academia and industry to develop and design more practical environmental studies to further increase practical knowledge.

#### **4.7.2 ENHANCERS OF GREEN SHIPPING PRACTICES ADOPTION**

##### **4.7.2.1 Competitor influence as an enhancer for Green Shipping Practices Adoption**

Competitor influence was identified as one of the mimetic influence under institutional forces that can influence organisational behaviours DiMaggio & Powell (1983). In environmental management, research has revealed this to be the case. Sarkis et al (2011) stated that “enterprises may follow or ‘mimic’ competitors merely because of their success”. This opinion is also upheld by (Christmann and Taylor, 2001); Zhu and Liu, (2010); Zhu et al (2007); Aerts et al., (2006)) additionally noted that “imitation plays a significant role for enterprises to implement GSCM related practices”. These authors suggest that the influence of competition as part of the equation for Environmental management practices adoption. There is however not much indication of this notion also in GSPs adoption as the data below would indicate.

*Yea, I think more and more competitors come out to say we're green and we're the greenest people and all of that but I don't think when we started on our route it influenced us particularly;*



*you would say it's one of the things you would say adds to it but is a long way down the list of importance*

*what you would however agree is that's it's nice thing to do but I'm not sure if competition would be an influence for us.*

*There is increasingly a bit of competitiveness but I don't think it's one of the things we would consider.*

*So, is this part of the reason why you also joined CCWG and start Green Practices?*

*Yes. So, the fact that you are trying to compete globally and be recognized as firm that has international standards did influence your decision to adopt GSP? Yes.*

*I think it is part of the equation but as I said earlier the main motivation is from the customer.*

The findings above appear fairly contradictory to findings observed in other industry sectors. Several of the respondents opine strongly that competition is not a strong influence on their decision to adopt GSPs. They do not totally discard its influence as they appreciate the presence of competitors and acknowledge their green activities, they are however firm in their assertion that GSPs adoption is more greatly driven by the customers' demands. They however highlighted that GSPs adoption avails them the opportunity to compete with other global competitors. In this instance, it can only be said that competitor influence has a seemingly enhancing role as most of the respondents affirm that

it is not much an influence. This finding is significant as it highlights that research in the shipping industry may not be an absolute replica of what is obtained in other industry sectors hence the need for increased academic attention. Furthermore, these findings highlight the possible influence of contextual difference and how it may affect replicated research in other industry sectors. While the shipping share similarities with other industry sectors particularly Supply chain and Logistics, there may be certain fundamental differences responsible for this slight tilt in the findings. Further research would be recommended to ascertain what is responsible for this variation.

#### **4.7.2.2 Leadership and Managerial Influence as an Enhancer for Green Shipping Practices Adoption**

This sections examines evidence from data collection to highlight if and how leadership may influence GSPs practices. Evangelista P, (2014) studies of similar subjects amongst other factors identified senior management support as one of the factors that influenced the adoption of green practices amongst thirds party logistic companies. This finding was similar to that of Lin and Ho (2011). This evident below will help to establish if the shipping sections replicates similar experiences.

*it needs to get right to the top of a business before things get done; then the finance guy goes, woowow woow we need to get right to the top of a business before*

*We do have an environmental committee which is chaired by our CEO and they make the major decisions and then drive it from there.*

*That is really true, like you rightly said, when it comes from the top, it is easier to get it done.*

*Yea it easier to get things done, to drive it and achieve reasonable results.*

*It is easier to get things done, it's making things happen much quickly.*

*So you would say that the leadership of the organisation is supportive*

*Oh absolutely, Yea, and Yea*

*And in your opinion that makes it more effectively,*

*Yes, definitely: without, top management support It is always going to be a struggle. Errmm, but with top level support, Errmm, yes things do happen*

*Yea the leadership support GSP very strongly and being here in the UK at this time participating in this maritime emission reduction research project also shows their support. The fact that I am the only one overseeing this aspect of the company could have been enough reason for it to be undermined however the support has been enormous. SO they are very supportive.*

*At the management level, I believe the entire top management level share the same opinion and support for Green Shipping.*

*The chief executive largely supports this initiative and tries to extend it to other aspect of the business as well.*

*They are all very supportive. I personally think that any person who loves life would naturally support this kind of initiative.*

*generally, the staffs are very much in support of adoption and implementation of GSP.*

*I think my perception is that they are very supportive. This company is owned by a family and it is not very common that a family company will be very developed in this aspect because it is a one-man show. So considering this company as such the support from the top is very positive.*

*I would say in our department and at the management level particularly with departments that are in close relations with environmental issues the perception is also very positive.*

The evidence above gathered from both case organisations demonstrate senior management support for GSPs adoption. This support is seen in one of the organisations as the Chief Executive officer himself chairs the environmental committee. This is particularly important as being a member and chair not only

demonstrates authority at the highest level being supportive, it also indicates that environmental issues receive prioritized attention hence actions are likely to be carried out much quicker than if the situation were otherwise. Additionally, the support is seen through fostering strategic partnerships (industry and academia collaborations) to resolve environmental issues in shipping. The environmental manager of Alpha ports noted this as he was being deputised on one of such projects at the time of this research. He particularly emphasized that Alpha Line being family owned enjoys uncommon support as not many “one man show” organisations pay such great attention to environmental issues but in this case the support is quite astonishing even to the extent of forging strategic partnerships to tackle environmental issues. The evidence reasonably enhances the conclusion that Senior management supports GSPs adoption; the interviews reveals that this is in fact needful for any progress to be made on this issue. The statement *“it needs to get right to the top of a business before things get done “* and similar comments like *“ when it comes from the top, it is easier to get it done”, Yea “it easier to get things done, to drive it and achieve reasonable results.”*, *“It is easier to get things done, its making things happen much quickly.”*, *“without, top management support It is always going to be a struggle”*, all indicated that the success of an GSPs adoption is heavily reliant on the support of organisational leadership. While the evidence is conclusive of leadership supports for GSPs adoption, it does not conclude that Leadership is a driver for GSPs adoption. These findings are fairly different from those of Evangelista P, (2014) and Lin and Ho (2011) which emphatically establish leadership as a driver for GPA. The findings of this research do partly agree with theirs in that it identifies that the support of leadership is necessary for GPA however this research posits that

leadership does not act as a driver in this instance but more so an enhancer/supporter of GSPs adoption. There are no indications that the leadership itself moves/drives the process of GSP adoption however they are very supportive of the idea. Hence it is safe to conclude that leadership may not particularly be driver of GSPs however it plays a strong supportive role and is a needful part of successful GSPs adoption.

#### **4.7.2.3 Moral Conviction/values as an Enhancer for Green Shipping Practice Adoption**

This section examines if and how morals would influence GSPs adoption. This influence is expected to be largely at the individual level how individual conscience and the thought of right of wrong could influence the decision to consciously commit to environmentally friendly actions/activities. While several research has been done on drivers of GPA adoption with the identification of factors like coercive pressures ((Rivera, 2004), (Clemens and Douglas, 2006), (Kilbourne et al., 2002)), normative pressures (Carter et al., (2000), Ball and Craig (2010), Harris, (2006), Christmann and Taylor, 2001) and mimetic pressures (Aerts et al., (2006), Zhu and Liu, (2010), Christmann and Taylor, (2001). The author is unaware of any research that has tried to identify how moral conviction/conscience could influence GSPs adoption. The data below would be examined to draw a conclusion of the presumed line of thought.

*“Errmm About 25% to 30% demand strongly for environmental accountability. About doing business responsibly to do business with other major companies. I*

*mean if take things like BT or VW, their business has been a high profile example of being hammered by environmental incidents for poor practices."*

*"Do you feel a moral conviction to be environmentally responsible?  
Yes, personally I do"*

*"Yes, sure, every cares but the people who have the ability to influence and make positive impact need to act in a responsible manner. So you feel very strongly about it? YES."*

*"Yes, it does feel good to do, it is a good business especially because typically, Shipping business is very dirty so to implement GSP and see its impact does give a sort of moral justification and satisfaction because you achieve something good not just for yourself but also the world at large."*

*"I can say not everybody has a fear of the future and about what is likely to happen if we continue the way we are going. These are my personal thoughts."*

*"Yes, it is, I think it is quite late also and I don't know about what is likely to happen if we continue the way we are going. These are my e would be enough technology to sustain the future. It does appear as an effort to salvage an already pathetic situation. I am only very optimistic, because I fear we may have caused too much damage already. I think we will need to be stricter,"*

*"I think we are hurting the planet and we have to make a change. I wouldn't want to be pessimistic about change. I am only very optimistic, because I fear we may have caused too much that cannot be denied."*

The above quotes give an interesting perspective to GSPs adoption; one that hasn't quite been explored before in similar literature. The responses above begin to give an inclination of the possible influence of morals in GSPs adoption. The responses reasonably indicate that shipping professionals do feel a moral conviction/responsibility towards environmental issues. Severally, the participants expressed regrets over the fact that things haven't been done right in previous times; *"I think we are hurting the planet and we have to make a change."*, *"It does appear as an effort to salvage an already pathetic situation."*. What is even more important to see however is the level of optimism expressed about the possible future. While it does appear that things are bad presently, the respondents expressed great optimism about the current and future trends of environmental issues in the shipping industry. This optimism is similar to those expressed when the respondents discussed about meeting environmental targets and is expressed here in the following: *"Yes, it does feel good to do, it is a good business"*, *"a moral commitment to the world at large."*. This comments indicate that these individuals now not only see GSPs as a job function but a moral responsibility that can help to create a better future world. The participants also gave suggestions on how to reap the full benefit of GSP adoption highlighting that regulations need to be stricter: *"Yes, sure, everyone cares but the people who have the ability to influence and make positive impact need to act in a responsible manner."*, *"I think we will need to be stricter"*. From the discussions above, it can



be concluded that moral convictions do have a place in influencing environmentally friendly actions. While this sections doesn't convincing establish this as an emphatic driver, the effects of moral conviction cannot be displaced, hence, it is concluded here that moral convictions may not play a coercive role in GSPs adoption but it does play what can be considered a supportive/enhancing role for GSPs adoption. It would be exciting to see in future research when and how these convictions may become obscure in decision making possibly due to difficult executive decisions or financial pressure etc. One of the practical implications of this finding is that moral perceptions on environmental issues can be incorporated into recruitment. This will help shipping firms recruit people with the right attitude towards environmental issues hence, increasing the likelihood of successful GSPs implementation.

#### **4.7.2.4 Regulatory influence as a driver and an enhancer for Green Shipping Practice Adoption**

The influence of coercive pressures on organisations was first identified by DiMaggio & Powell (1983). Coercive isomorphism/pressures are pressures from entities upon which firms/organizations depend for resources. These pressures usually emanate from regulatory institutions that force firms to act in a certain manner because these organisations rely on them for resources/legitimacy. Several research has identified regulatory influence as one of the foremost coercive influences on firms (Darnall et al, (2003, 2006, 2008); Zhu and Sarkis (2007); Zhu et al, (2005,2007, 2008, 2010, 2012). The pressure could arise due

to fear of consequence for non-compliance (Davidson and Worrell, 2001) and has been commonly identified in Environmental management literature (Birett, (1998); Konar and Cohen, (1997); Geffen and Rothenberg, (2000)). It is desirable to find out if and how regulatory pressures influence GSPs adoption. The data below will be examined to find out how much regulatory influence exist in GSPs adoption.

*there are a huge number of environmental regulations that we have to follow as a business and it covers everything, from voyages to GHG to biodiversity, it covers everything and anything you can think off*

*We have to report GHG emission to the government annually, we pay about 16 times per tonne of fuel to but CO<sub>2</sub> allowances,*

*Yea there are lots of fines and taxes too. We pay taxes on energy, we have to purchase CO<sub>2</sub> allowances. All our waste handling is very tightly regulated and tightly audited, you name it. It's all regulated and the fine are very serious and some even carry prison sentences.*

*In comparison to other influences, which would you say is a lot more effective in making your organisation more environmentally friendly?*

*Well, when you've got anything that carries a six-month jail sentence, it tends to gain compliance because we've situations like that where we're discussing an issue, we're saying should we comply, should we not comply but the moment you make*

*top management aware that non-compliance might carry a jail sentence then the discussion is around who is going to do the time; and it tends to be quite a short conversation and we decide to comply. These are just the ways of business, we don't want to be non-compliant with regulation, it's not good for business, it's expensive and we're very mindful of the corporate reputation.*

*Do these regulations influence your decision to implement GSPs?*

*Yes, because what we do is we maintain compliance with regulations of the UK and whatever the EU regulations are.*

*Well, there are some things that they demand but more so, there are regulations that are binding on our actions and activities.*

*Yes, CCWG have some rules and regulations and we follow them.*

*there are no regulations that makes environmental practices mandatory in turkey.*

*Well, they are very much in support and they also give some extras if you try to be environmentally responsible. So, there are incentives? Yes, there are for example, if you want to change your equipment in the port they give you some loans etc. so there is financial support that encourage shipping companies to be environmentally responsible*

*How about tax reductions etc. Yes, I am aware that such facilities are in place but I am not very privy to such information as issues on finance are managed by other departments however I am very aware that the government is very much in support of the GSPs*

*Yes, there are standard rules and regulations, which we strive very hard to obey, for example; there are laws against burning Sulphur so we cannot burn bad bunker in coastal or port areas*

*For example, there are some special regulations that apply to the areas of straits and the Bosphorus and these regulations are very strict and there are punitive actions against violations. So yes, the government is very firm in enforcing these regulations.*

*Yes, there are very defined punitive actions in cases of violations of these regulations. These include fines, increased taxes etc. for examples if you use a lot of chlorophyll fuel in the restricted areas in turkey you get fined about \$25,000 for this action and while that may not seem like much it does accumulate into a large sum if you have to get fined at every port.*

*Yes, they are very effective, nobody wants to have to pay that amount in fines.*

*Not exactly, this doesn't quit affects/influence us because we already use highly quality fuels as well as have an instinctive motivation to be environmentally*

*responsible so we don't receive any fines regarding these but it is good to know that the government support and enforces the implementation of GSPs.*

*Turkey is not like the northern European countries that have very developed regulations.*

*In fact, we have to keep up with the changing regulations in order not to be caught unprepared. The regulatory bodies are quite strict and when sanctions are imposed it could be really detrimental. Recently, about last year, a regional carrier in US closed up because their vessels were really out of date and the regulation demanded that their CO2 emission must reduce significantly to which they could not cope so they sold the vessels and closed the business.*

*I don't think the government is very concerned. Shipping isn't a very big sector in this country*

*The government is quite concerned and involved sustainable transportation but it is at a very minute level*

*As far as I know, I'm not sure if there are any such things. I don't know if there are specific rules about green shipping and there isn't much enforcement*

*There could be such regulations but it is not very obvious. I don't see this in daily life or as issues discussed on common platforms.*

*No, in fact I am quite doubtful about the regulatory standards as well.*

*No, it doesn't because as a company we are doing far beyond what the government requires from us. We are way ahead of the regulatory requirements of this country with respect to the said topic. That is my opinion, because it is not an issue of priority in this country.*

A careful examination of the data above showed that regulatory influence on GSPs appeared to vary reasonably between the two case organisations. While it can be reasonably concluded that regulatory influence plays a role in GSP adoption, the type of influence and extent seemed different. This difference appears to be largely associated with varying national context and possible firm size. This is not uncommon as several research has highlighted the influence of contextual differences and how it might alter similar research replicated in different contexts (Etzion, (2007), Lin and Ho (2010), Hoejmose et al, (2014) and Zhu et al (2007, 2008a, 2008b). Alpha Line operates from Turkey a developing Asian country with possibly an underdeveloped environmental regulatory framework as was also highlighted by the participants: *"Turkey is not like the northern European countries that have very developed regulations."* This is a contrasting national context to that of Gamma Ports which operates in the UK which is a first world country with a robust environmental framework which one of the Gamma Ports respondents also verified; *there are a huge number of environmental regulations that we have to follow as a business and it covers everything, from voyages to GHG to biodiversity, it covers everything and anything you can think off"*. This forms the

foundations of the varying perception/influence of regulations/government. Subsequently, the influence of regulations in both case organisations is examined separately to allow for in-depth analysis.

### **GOVERNMENT/REGULATORY INFLUENCE ON ALPHA LINE GREEN SHIPPING PRACTICE ADOPTION.**

The evidence from participants from Alpha Line depict that regulatory forces influence environmental issues and GSPs adoption howbeit not in a largely coercive manner. One of the respondents emphatically stated that: *“there are no regulations that makes environmental practices mandatory in turkey.”* The reason stated for this laxity is the fact that shipping isn’t seen as a big sector in the country. The respondents further highlighted that *“The government is quite concerned and involved sustainable transportation but it is at a very minute level”*. This is evident by the presence of environmental regulations in specific areas and which appear to be quite stringent carrying reasonably severe punitive measures (fines): *“Yes, there are very defined punitive actions in cases of violations of these regulations. These include fines, increased taxes etc. for examples if you use a lot of chlorophyll fuel in the restricted areas in turkey you get fined about \$25,000 for this action and while that may not seem like much it does accumulate into a large sum if you have to get fined at every port.”* (Alpha Line., 2016). It is safe to assume that this sort of deterrent while it doesn’t apply to the whole shipping sector does help in enforcing some environmentally friendly actions. The only highlighted profound regulatory influence appears to from professional institutions: *“Yes, CCWG have some rules and regulations and we follow them”* (Alpha Line., 2016) (It has already been previously highlighted in this research

that professional institutions were observed to exact coercive pressures rather than the typical normative influence) in this instance. The possible reason for this variation was said to be the size of the said institutions, which avails them the opportunity to exact coercive influence. Having said that, there is evidence to suggest that the government supports GPS adoption. This support is in form of financial incentives (loans, tax reductions etc.) that encourage environmentally friendly activities: *“they are very much in support and they also give some extras if you try to be environmentally responsible. ....Yes, there are for example, if you want to change your equipment in the port they give you some loans etc. so there is financial support that encourage shipping companies to be environmentally responsible”*. It can be implied in this instance that the typical coercive role of regulatory authorities (government) is not particularly identified in this instance rather regulatory influence plays more of a supporting/enhancing role in GSPs adoption in this context. This idea is also supported by previous research (Andrews et al., (2003); Darnall et al., (2008)). Darnall et al., (2008) stated *“less coercive forms of regulatory pressure are becoming increasingly relevant as governments expand their programs that encourage EMS adoption”* hence this finding agrees with existing literature.

#### **GOVERNMENT/REGULATORY INFLUENCE ON GAMMA PORTS GREEN SHIPPING PRACTICE ADOPTION**

In this section, the evidence relating to Gamma Ports government/regulatory influence is examined. The evidence suggests that coercive regulatory influence plays a huge role in GSPs adoption. Firstly, it is good to note that in contrast to Alpha Line, Gamma Ports respondents acknowledged that they are subject to a



vast array of robust regulatory requirements: *“there are a huge number of environmental regulations that we have to follow as a business and it covers everything, from voyages to GHG to biodiversity, it covers everything and anything you can think off”*. This is further complimented by evidence made available by Gamma Ports for environmental reports. It was highlighted in that sections that robust regulatory framework coupled with years of Green Practice is likely responsible for such extent of performance reports. The coercive regulatory influence is seen to manifest through emission reports, emission taxes, energy taxes, waste management, regular audits, air quality control etc., such as is not available in the Alpha Line context. Furthermore, the punishment for non-compliance in this context is seen to be more intense in comparison to that observed in the Alpha line context; *“It’s all regulated and the fine are very serious and some even carry prison sentences.”* Taking all the above into consideration it can be assumed that coercive regulatory influence drives GSP adoption in Gamma Port. This assumption is verified by the statement of one the respondents: *“when you’ve got anything that carries a six-month jail sentence, it tends to gain compliance because we’ve situations like that where we’re discussing an issue, we’re saying should we comply, should we not comply but the moment you make top management aware that non-compliance might carry a jail sentence then the discussion is around who is going to do the time; and it tends to be quite a short conversation and we decide to comply.”* In the cited quote the coercive influence of regulatory authorities is seen to override the conversation resulting in compliance. It can therefore be concluded that robust regulatory framework coupled with stringent punitive measure does drive GSPs adoption in Gamma Ports. This finding is also consistent with literature as Konar and Cohen, (1997),

Birett, (1998), Geffen and Rothenberg, (2000), Davidson and Worrell (2001), Darnall et al, (2003, 2006, 2008, Zhu and Sarkis (2007); Zhu et al, (2005,2007, 2008, 2010, 2012) and a host of others have all previously identified. The work of Davidson and Worrell (2001) is particularly insightful here as the cited instance does exemplify the fear of consequence for non-compliance resulting Environmental management adoption and in this instance GSPS adoption.

The separate examination of the two case organisations above does highlight the varying influence of regulatory pressure. In Alpha Line the evidence available was not convincing enough to conclude on the coercive influence of GSPs. It was however sufficient to demonstrate the supporting/enhancing role of regulatory forces in GSPs adoption. In Gamma ports, however, the evidence strongly indicated the coercive influence of regulatory forces with exemplified instances of how fear of consequence resulted in compliance. Both instances have been supported by literature. Additionally the variation in the data obtained is associated with contextual differences in terms of nationality and size of the organisation. Evidence of how this is possible has also been presented. This section contributes to existing body of knowledge and Green shipping literature by highlighting that the success of GSPs adoption is reasonably dependent on the availability of robust regulatory framework. Additionally, it highlights the importance of careful consideration for context and how this might affect the deployment of regulatory facilities. It was noted in the instance of Alpha Line that because shipping is not a frontline industry sector it is not subject to adequate regulatory scrutiny. The adoption of GSPs in that instance was then subject to customer influence as has been previously identified and

supporting/enhancing regulatory influence. This knowledge is particularly useful for situations where over exertion of regulatory structures might be detrimental for the growth of the industry/organisation or in developing countries where the establishment of robust regulatory framework is almost impossible.

#### **4.8 GREEN SHIPPING PRACTICES ADOPTION AND ORGANISATIONAL IMPACT**

A reasonable amount of literature has shown that there is a relationship between environmental activities and firm performance (Klassen and McLaughlin, (1996); Melnyk et al., (2003); Montabon et al., (2007); Venus (2011); Hofer et al., (2012)). Some of these include early works like that of Klassen and McLaughlin (1996) who found a positive correlation between Environmental Management announcements and increased market value of the firm. Montabon et al. (2007) later identified similar relationship between environmental activities and product and process innovation as well as growth in sales. Zhu and Sarkis (2004) in their research observed a trend in which firms that adopted environmental activities also seemed to experience improvements in their operational and environmental performance. Jacobs et al. (2010), however could not conclude on their research having obtained mixed result on similar research. Several academics (Rao, 2002; Rao and Holt, 2005, Laosirihongthong et al., 2013) highlight the need to understand the relationship between green practice adoption and organisational performance to reap the full benefit of such activities hence the following sections examine the data available to see the impact of GSPs on the performance of Alpha line and Gamma Ports. The analysis

below is grouped into two main categories namely perceived benefits and perceived constraints of Green Shipping Practice Adoption.

#### **4.8.1 PERCEIVED BENEFITS OF GREEN SHIPPING PRACTICES ADOPTION**

In the sections, the data on perceived benefits is examined. Four main perceived benefits were identified in this research: cost savings, competitive advantage, process efficiency and reputation and market strategy all of which are somewhat interrelated/interdependent. Cost saving was observed to be through optimal operations directed towards emissions reduction and since emissions are directly proportional to fuel consumption, any attempt to reduce emission does have a direct impact on fuel reduction. It is commonly known that fuel cost is one of the biggest cost in shipping hence when fuel consumption is reduced money is saved. Process efficiency is another benefit identified through this research to be a benefit of GSPs adoption. Process efficiency is achieved using lighter fuels, more efficient energy use and better machinery. This helps to achieve a seamless flow of cargo shipments. Additionally, the research revealed shipping firms perceived that GSPs adoption gave them competitive advantage. This is because being Green is generally perceived to be a selling point and hence can be used a source of differentiation in the market. Instances were also cited of how clients gave concessions to case study firms for demonstrating environmental friendliness. Lastly, Reputation and market strategy was identified as a benefit. This closely related to the competitive advantage. The case firms perceived that being green made them appear to be more reputable and awarded them some

form of legitimacy in the shipping industry. These four points are discussed below with evidence to support their existence from the case organisations.

#### **4.8.1.1 Competitive Advantage as a perceived benefit of Green Shipping Practices adoption**

There is reasonable amount of research that suggests that competitive advantage is a benefit of environmental activities to firms (Lin and Ho (2010); Laosirihongthong et al., 2013). These researches (Kimberly and Evanisko, (1981); Damanpour, (1991); Deng and Wang, (1998); Zhu and Weyant, (2003); Murphy and Poist, (2003); Gonzalez-Benito and Gonzalez-Benito, (2006a); Zhu et al. (2007); Sarkis et al., (2011); (Buyukozkan and Cifci, (2012); Hofer et al, (2012)) have examined various industry sectors (GSCM, Reverse Logistics etc.) however green shipping literature has not been sufficiently studied (Lun et al, (2011); (Lai et al, (2011)). The data below is a self-reported perception of how GSPs adoption culminates into competitive advantage.

*"It just makes it better, because we are a green business we, are likely to be more sustainable."*

*"Yes, there are benefits, which include getting new customers"*

*"we see the big companies and globally recognised brands particularly from developed regions of the world, those that shipping thousands of containers enforcing and placing demands on shipping companies to adhere to environmental*

*regulations (e.g. SECA) to secure their business”*

*“you have to keep investing in suitability even though you would have to incur extra cost however in the long run, it becomes obvious that this has benefits for us also because the more efficient our vessels and processes are (including selling and procuring), the more efficient and profitable we are as a company”*

*“It is also becoming common that some clients support us in our pursuit of environmental responsibility by providing financial incentives to us for being more environmentally responsible, these incentives are usually in the form of preferential consideration during contract bids e.g. If we happen to have the higher price quotes and equal service details as a competitor, we could be favourably considered and awarded the bid despite having quoted a higher price and this is quite encouraging. While this may not be big factor it does encourage us as an organisation to pursue environmental responsibility even more so in order to sustain business relationships with our clients as well as the possibility of new opportunities although this is not guaranteed.”*

*“It is more of a selling point rather than the influence of competitor. It is more about continuity of the business.”*

*“I think as a company we see it as a necessity for the continuation of our business”*

*“Of course, implementing GSP also provides us a more efficient way to run our vessels which helps us save more which is a huge advantage.”*

*"It sorts of guarantees our sustainability as a company as this is becoming an increasing business culture around the world."*

*"the feeling of fulfillment doing business in a trust worthy manner which is a huge point of differentiation from our competitor. So, it is a competitive advantage for us with our clients."*

The data above indicate that the respondents perceived that GSPs adoption enhances their firm's competitive advantage. The respondents severally indicated that being green helps their firm compete with other global brands based on their improving green capability as this is increasing becoming a global business culture hence being green sort of guarantees their survival. Additionally, the research showed that the respondents saw it as a unique selling point which helps them retain existing clients as well as reach out to new ones. An instance was cited of how being green availed them a better negotiation position during a contract bid which helps to further demonstrate the competitive advantage benefit of being green. These findings agree with existing studies (Gonzalez-Benito and Gonzalez-Benito, (2006a); Zhu et al. (2007); Sarkis et al., (2011); (Buyukozkan and Cifci., (2012); Hofer et al., (2012)) in other industry sectors. It further extends Green shipping literature which is rather lacking at the moment. This finding is quite insightful for academia and industry in that it fills an existing void in shipping literature relating to the impact of GPA in shipping firms. It further benefits practitioners highlighting benefits of GPA the knowledge of which can encourage greater/better and continuous environmentally friendly

activities. This opinion was corroborated by one of the respondents *“it does encourage us as an organisation to pursue environmental responsibility even more so in order to sustain business relationships with our clients as well as the possibility of new opportunities although this is not guaranteed.”*

#### **4.8.1.2 Cost Savings as a perceived benefit of GSPs adoption**

The data below highlight cost saving as one of the benefits of Green Shipping Practices adoption. Evidence of this already exists in literature particularly in other industry sectors (GSCM, Green IT etc.). Curkovic et al., (2000), Zhu and Sarkis, (2004, 2007), Wu and Pagell, (2011) and Laosirihongthong et al., (2013) and a host of several other researchers have highlighted cost savings as one of the benefits of GPA. This section identifies similar findings in the shipping sector through GSPs adoption.

*“these things usually mean that you spend less.”*

*“to the bottom line by being more energy efficient, and reducing GHG emission: we spend less.”*

*“if we look after the environment better, we use less energy so we are more economically efficient,”*

*“our efforts to reduce our carbon emissions also means cost savings on our part. In the shipping industry, the main cost is the vessel rent and bunker consumption,”*



*“reductions of bunker consumption is one of the huge benefits as well because bunker consumption is the biggest cost in shipping business and in our attempt to reduce our carbon footprint we have to consciously reduce our bunker consumption, which in turn amounts to reasonable cost saving for our company”*

*“you know because usually there are business benefits as well, either reputational to the bottom line by being more energy efficient, and reducing GHG emission: we spend less.”*

The quotes above indicate how cost savings is made through GSPs adoption. The respondents highlighted that bunker cost is one of the highest cost in shipping. This is an opinion also upheld by several other academics (Ronen (1982, 2011); Sheng et al. (2014); Yin et al. (2014)) whom have all in some way highlighted the enormous cost of bunker in shipping business and have conducted research on how to minimize bunker consumption. GSPs are perceived to have a cost saving benefit for the case organisations studied in this research. The respondents highlight that efforts to reduce GHG emissions/carbon footprints means a conscious effort to minimise fuel consumption hence the associated cost. Additionally, cost saving is also closely identified with efficiency. This efficiency is observed to manifest through optimal energy use and improved process all of which is somewhat perceived to translate to cost saving. These findings agree with other research that has been carried out in other industry sectors. It is however particularly useful in GSPs adoption as it extends research in Green shipping literature which is only just emerging. Additionally, it is worth noting that most research conducted on similar subject has largely been through

quantitative methods. This research exploring a qualitative approach further increases confidence in previous findings having arrived at similar finding as those obtained from previous research.

#### **4.8.1.3 Reputation and Marketing Strategy as a perceived benefit of Green Shipping Practices Adoption**

Previous sections have discussed other benefits of GSPs adoption; reputation and market strategy are also benefits that are identified by this research to accrue as a result of GSPs adoption. Lin and Ho (2011) highlighted that perceived benefits of an organisation's innovative activities such as GPA would usually bring benefits in terms of improved organisational reputation. This opinion is also upheld by several other literatures (Barney, (1991); Welford, (1995); Carter et al., (2000); Sarkis, (2009); Forstl et al., (2010); Sarkis et al, (2011); Lun et al. (2015)). This section examines the responses of the respondents to further shed light on how organisational reputation is improved by GSPs adoption.

*"the benefits are manifold really, I suppose your corporate image is improved,"*

*"Another benefit is the reputation that good environmental records avail us. It is a very good marketing strategy."*

*"Commercially, it makes us a more likeable company, so it is a good point of sale."*

*"Mostly asides cost savings; it improves our reputation and makes us able to compete globally. Being Green is one of the mandatory requirements for being a*

*globally recognised shipping company. As a growing company, we have received some recognition for this."*

*"if it's poor and our image and corporate responsibility is damaged, some people will start asking questions why are we doing business with these people."*

The responses above clearly express the perceptions of the respondents who all perceive that GSPs adoption improved their organisation's reputation and hence became a marketing strategy. The respondents agreed that being green made them a more likeable company, improved their corporate image and helped them more globally recognised which made them more globally competitive. One of the respondents emphatically highlighted that poor environmental performance could result in loss of reputation with even worse consequences: "if it's poor and our image and corporate responsibility is damaged, some people will start asking questions why are we doing business with these people." This idea is also reasonably upheld in literature (Handfield (1997); Preuss (2001); Sarkis (2001); Roberts (2003); Bowen et al., (2003); Rao (2005); Zhu et al., (2005); Welford (2006); Seuring and Muller (2008)) whom have all conducted research with similar findings. In this instance, the findings align with the first set of literature demonstrating that improved organisational image/reputation and are benefits of GSPs adoption so much such that it has become a marketing strategy. This study contributes to existing knowledge by extending studies in shipping literature identify benefits of GSPs adoption which has not been previously explored. This is quite insightful as it can be cited as additional motivation to practitioners to further improve on their performance. Shipping

firms as well as professional institutions can refer to these findings using it to stimulate further adoption and dissemination of GSPs.

#### **4.8.1.4 Improved Process Efficiency and Green Performance as a perceived Benefit of Green Shipping Practice Adoption.**

Lun (2011) opined that “Green management practices provides opportunities for firms to achieve greater organisational/operational efficiency. This efficiency is achieved through waste reduction, use of new technology, better use of energy and optimal process. Other researchers have also supported this opinion by putting forward literature having conducted research that uphold similar opinions (Welford, 1992), (Hart and Ahuja, 1996); (Zhu et al., 2007); (Viana et al., 2009); Chang, (2012); Lai et al., (2013). Similarly, green performance is also closely related to improved process efficiency. Kuei et al., (2015) in agreement with other authors like Zhu et al., (2007); Seuring and Muller, (2008); Chow and Chen, (2012); Kuei et al., (2013) also highlighted that green performance can be a benefit of green practice adoption. The data below exemplify similar findings in the shipping sector. It is now being examined to see how process efficiency is achieved though GSPs adoption.

*“I mean, the key thing in the industry is really efficiency; how fast you can handle a cargo, that would be the thing of real interest but that in itself drives efficiency because the faster we can do it the more efficient we are.”*

*“the operational department are focused on moving cargos as quickly as they can*

*and another key consideration is doing it safely”*

*“you tend to be efficient because you’re using light energy, light fuel, recycling waste,”*

*“Our energy efficiency is improving a lot and that’s just good business practice anyway. So being green is an added benefit and there’s a good number of benefits for being green.”*

*“it becomes obvious that this has benefits for us also because the more efficient our vessels and processes are (including selling and procuring), the more efficient and profitable we are as a company so this is one aspect of it that was generally accepted in the company”*

*“Well yea, one of the key ones in fact for a few years is that we are striving for a 30% reduction in our carbon intensity that is to reduce our CO2 emission per TEU and at the moment we’re about 26.4% from where we started so we’re making good progress and that is just one of them, we also have objectives and targets for Sulphur dioxide which is about 18% and Nitrogen dioxide which is about 20% so we monitor all these things continually to drive them down.”*

*“We have only reported our performance twice, and our CO2 emission has improved by about 3% and we also calculate our performance in house and from 2011 to 2015 we have made a 12.5% improvement in 4.5 years.”*

*"Yes, we set targets, and in fact it is one of the rules of CCWG, you need to set targets and try to achieve them. Our target is to achieve 20% reduction by 2020."*

*"in fact for the last few years, we've not being constrained by investment on things that are more beneficial to the environment. We're doing more and more and if we asked for more money to do more, we wouldn't have the time to do it at the moment so the next few years we've more significant projects lined up to curtail emission and GHG and other emissions, energy efficiency."*

*"you know because usually there are business benefits as well, either reputational to the bottom line by being more energy efficient, and reducing GHG emission: we spend less."*

*"Of course, implementing GSP also provides us a more efficient way to run our vessels"*

The evidence above indicates that the respondents perceive that improved process efficiency is benefit of GSPs adoption. Firstly, the respondents indicate that efficiency is a key issue in shipping as customers are quite keen on how quick cargoes are transported as well as safety considerations. The respondents indicate that GSPs adoption helps achieve this efficiency through optimal processes and the use of light fuels; *"you tend to be efficient because you're using light energy, light fuel, recycling waste"*. This statement is further complimented by another respondent who stated that *"it becomes obvious that this has benefits for us also because the more efficient our vessels and processes are (including*

*selling and procuring), the more efficient and profitable we are as a company”.*

This highlights that improved efficiency increases profitability. Another respondent indicated that GSPs adoption improves efficiency which is good business practice hence has other business benefits. These findings agree with the literature cited above (Welford, 1992), (Hart and Ahuja, 1996); (Zhu et al., 2007); (Viana et al., 2009); Chang, (2012); Lun et al (2011); Lai et al., (2013)) further showing that GSPs like other Green Management practices can improve firms’ operational efficiency. Improved Green performance is also perceived by the respondents to be a benefit of green shipping practice adoption. The respondents highlighted that their environmental performance improved citing how much improvements they have made over a reasonably short time span. Furthermore, the respondents expressed firm optimism about further improvements agreeing with the literature cited above. This is good contribution to literature particularly shipping literature as it highlights the benefits of GSPS adoption and has the potential to trigger further adoption of GSPs amongst practitioners.

#### **4.8.2 PERCEIVED CONSTRAINT OF GREEN SHIPPING PRACTICES ADOPTION**

This section discusses the evidence available to identify any reported constraints to GSPs adoption. The perceived constraints are issues identified by the respondents to mitigate against GSPs adoption. Uzzi, (1997); Sarkis et al., (2011) and Kuei et al., (2015) all mention the tendency of constraints to Green Practice Adoption but did not mention in detail what these constraints may be. No

previous research has explored the similar issues in the shipping industry. To the best of the author's knowledge, this research will present the evidence available to identify the perceived constraints to GSPs adoption.

#### **4.8.2.1 Unlevelled Competition due to Regulatory lax and Cost of Investment as Perceived Constraints of Green Shipping Practice Adoption.**

The data below will be examined to arrive at concise conclusions hence contributing to literature on the perceived constraints of GSPs practices adoption. Two main issues were identified to be constraints. The data below extends the existing body of knowledge particularly in the shipping sector by highlighting these constraints.

*"I cannot particularly say it constrains our business however sometimes it is quite difficult to do especially in Turkey because we are about the only shipping firm in Turkey that is actively involved in GSPs and related practices. So, it is difficult to achieve the similar results like our global competitors in this regards since we are about the largest shipping company in Turkey it is quite difficult to compete globally in this regard. Also, it is somewhat unfair that we are the only one in Turkey having to expend resources in this regard, which in a certain way could amount to local disadvantage for our business."*

*"Turkey can be considered as a developing country, our economy is quite big but in comparison to western countries, we are still behind. So it is not really in our culture to be detailed about sustainability issues"*



*“you have to keep investing in suitability even though you would have to incur extra cost”*

*“Our position in the market being a liner and feeder service somewhat constrains our ability to compete when we have to observe all these regulatory requirements being put in place since our competitors are not particularly as interested in environmental practices.”*

*“No I don’t think so. I don’t think it is a constraint because our clients understand that this comes with addition expenses for instance using cleaner fuels cost about a third of the price more than the common fuels. It is however necessary that governments enforce strict regulatory requirements across aboard in order to level the playing ground between all business players as well to ensure the success of this initiative”*

*“There are constraints, I think there are always constraints you know to totally reduce your emission impact you would need to get rid of all your old equipment and invest in the very latest leanest greenest equipment”*

*“You know you have to make progress at the same time making profit. If the main focus is on doing no damage to the environment, then the result would be to just shut the doors and go home.”*

The data above sheds some light into the perceived constraints that militate against green shipping practice adoption. Two main issues are highlighted here:

unlevelled competitiveness due to lax regulatory influence and cost of GSPs adoption. The former issue is perceived to unevenly tilt the competition against the said shipping firms having decided to be environmentally responsible in a context where sustainability is not a business culture. This is perceived to be unfair by the respondents as they are investing in GSPs adoption and observing regulatory requirements that are not adequately monitored by regulatory bodies hence allowing other shipping firms to get away with marginal environmental errors. The respondents stressed the need for the government to enforce regulations to make the industry a level playing ground for all shipping firms. The latter issue Identified is the cost of GSPs adoption. The respondents highlighted that investing in sustainability is a continuous endeavour. These investments are usually huge and may be quite discouraging at the initial stages but they will pay off in the long term. These findings extend the existing body of knowledge in this regard. As it has been previously stated, not many researches have expressly stated the specific constraints to Green Practices Adoption. Identifying these constraints are particularly insightful in practice and highlights areas where shipping firms need help from other industry stakeholders to alleviate the existing problems hence fostering continued GSPs adoption hence the practical implication of this findings.

#### **4.9 CONCLUSION**

This section has presented the data collected through interviews to answer the research questions set out at the beginning of this research. The sections began by introducing the case organisations demonstrating their fit for the research purpose. The data collected was then presented and analysed over six sections based on the identified themes and sub-themes developed during the coding

process as described in the methodology chapter. This chapter has presented data that provides insights into the understanding of GSPs, Adoption of GSPs, Drivers and Enhancers of GSPs and Perceived Benefits and Constraints of Green Shipping Practices. In the following chapter, the research questions presented at the beginning of the research will be adequately answered making use of evidence from this chapter. The theoretical and practical contributions of this research will be discussed in greater detail in Chapters 5 and 6 as well as limitation and recommendation for future research however some of the theoretical contribution of this research is that no previous research had empirically validated the explanation of any theory as responsible for GSPs adoption. Additionally, Moral conviction/Values was observed to also influence GSPs adoption in industry. Institutional theory does not fundamentally account for Moral convictions/values in its dimensions hence this research proposed an extension of Institutional theory to include this additional factor as has been included in the conceptual framework presented in the discussion chapter. Further theoretical contributions include the observation of professional bodies that would typically exert normative influence appearing to exert coercive influence in this instance. It is argued in this research that the size, variation/scope of membership (world renowned brands etc.) of professional bodies could translate their typical normative influence into coercive driving member organisations to adhere to its regulations in return for continued membership and legitimacy.

This research also explored the use of qualitative methodology as opposed to the vast array of quantitative studies on similar subject areas as has been highlighted

in the literature review. This reason for this approach was justified by its applicability to budding areas of research where neither literature or data abound as is the case with GSPs. Additionally, the emphatic strength of the qualitative approach providing in-depth understanding of the researched area was helpful in identifying and understanding the factors responsible for GSPs with insight of how adoption occurs. Some of the profound insights generated include the possibility of professionalism existing on two levels (organisational and individual).

## **5.0 DISCUSSION**

### **5.1 DISCUSSION OF RESULTS**

This thesis provides insights into the factors influencing and the impact on organisational performance. This research through qualitative methodology using interviews as the data collection technique discovered that the understanding of GSPs in the industry agreed with the conceptualised definition in literature. The respondents used similar words as was in the conceptual definition and cited instances as those inferred from literature. Furthermore, the six dimensions of GSPs conceptualised by Lai et al., (2011) was found to exist in practice hence validating the previously conceptualised dimensions of GSPs. This research also examined the factors influencing the adoption of GSPs. Six factors were identified; Customer influence, professionalism, regulatory influence, leadership and managerial support, competitor influence and moral convictions & values. These factors were observed to exert different level of influence hence the development of two categories (Drivers and Enhancers). The Drivers were observed to have great influence and were responsible to effect prompt adoption of GSPs while Enhancers had a subtler influence hence only supporting GSPs adoption. The impact of GSPs adoption on firm performance was also studied and two types of impacts were identified: the perceived benefits being the reported positive impact of GSPs and perceived constraints which are the negative impacts of GSPs on the firm. The sections below discuss the findings in greater details.

## **5.2 WHAT IS THE UNDERSTANDING OF GREEN SHIPPING PRACTICES IN THE INDUSTRY?**

This research set out to find out how the industry defines/understands green shipping practices. This is to see if there is a disparity between industry understanding and what was conceptualised in literature. While previous research had somewhat defined environmental practices in focusing on specific aspects of shipping operations, the industry definition encompasses all aspects of shipping operations in its definition of GSPs. This include emission reduction, waste disposal management, efficient energy use, use of light fuels, optimizing vessel operations, membership of professional organisations (CCWG, ECOVADIS), route optimisations, investing in vessels to meet regulatory requirements, setting targets for emission levels, collaborative research activities etc. The response of the respondents can be summarized in this definition; “it is all efforts to reduce negative environmental impact of the shipping activities”. The definition closely matches that of the conceptualised literature which is also the adopted definition for this research; “sustainable handling and distribution of cargoes” as conceptualised by Lai et al, (2011).

## **5.3 WHY ARE SHIPPING FIRMS BEGINNING TO ADOPT CERTAIN GSPS?**

An understanding of why shipping firms adopt GSPs had somewhat been an enigma (Lai et al., 2011). While some previous research (Lai et at., (2011); Lai et al., (2013); Lun et al., (2015)) had conceptualised GSPs definition, dimensions and proposed performance impact of certain dimensions of GSPs, the reason for GSPs practice remained unidentified. This research fills this research gap by identifying factors that influence GSPs adoption. From theoretical literature in

similar studies, certain factors were identified as likely to drive the adoption of green practices. This research through the data qualitatively collected further discovered that these factors had different levels of influences leading to the categorization of some of them as Drivers and others as Enhancers. Drivers were observed to have a direct influence resulting in the immediate adoption of GSPs while Enhancers were only seen to be complimentary factors that supported GSPs adoption. In total six factors were identified two of them directly falling under the Driver category (customer influence and professionalism influence) and three falling under the Enhancer category (Competitor, Leadership and Managerial Influence and Moral Conviction/values). The last factor (Regulatory influence) was observed to exert influences that fell under both categories. Regulatory influence seemed to vary depending on how effective regulatory authorities were. In instances where regulatory authorities were lax, it was observed to be more of an enhancer and in instances where they were firm they exerted driver influences. Professionalism was observed to also have an Enhancing influence due to Environmentally related studies of the respondents which encouraged adoption of GSPs. Additionally, this research identified a factor that had not been previously identified in literature. It was discovered that moral convictions did play a role in GSPs adoption as the respondents all admitted to a feeling of guilt for having caused environmental damage in previous time. This feeling is now seen to encourage a decision to be more environmentally friendly in operations going forward. This research identified this factor as an enhancer and not a driver as the data collected did not sufficiently demonstrate it to be directly responsible for GSPs adoption. This finding extends existing literature in GPA as it introduces the influence of

morals/values on the decision to adopt GSPs and possibly other Green practices. This is particularly insightful and could be a useful tool to advance the course for GPA as practitioners could be encouraged to do what they perceive to be the right thing rather being forced to abide the regulations.

#### **5.4 IS THE ADOPTION OF GSPS A PROACTIVE OR A REACTIVE APPROACH?**

This research sort to find out the approach leading GSPs adoption in the industry. Two approaches were examined (proactive and reactive approach). The proactive approach suggests a self/intuitive approach by shipping firms to adopt environmentally friendly practices while in contrast a reactive approach to GSPs would suggest that GSPs adoption by shipping firms is merely a response on the part of shipping firms to some form of influence/pressure from within or outside of the organisation. Similar research approach was explored in GSCM by Laosirihongthong et al., (2013) whom discovered a reactive approach to be the dominant approach in GSCM adoption. The data collected in this research suggests that GSPs follows a combination of both approaches. It appears to have begun as a reactive approach in response to customers' pressures and pressures from professional bodies however, it now seems to progress as a proactive process. This conclusion is drawn as the respondents severally opined that they now go beyond the benchmarked requirements of regulatory authorities in their GSPs adoption. The continued presence of regulatory influence does however suggest a reactive approach. This research through this finding contributes to shipping literature by showing the approaches taken to GSPs adoption as this had not been previously explored in shipping literature. The knowledge of these two approaches also helps to identify the need for collaboration between



regulatory institutions and shipping firms to work out a suitable model for continued GSPs adoption. Seeing that shipping firms are willing to carry out voluntary green activities as revealed by this research and complimented by previous research (Sharfman et al., (1997), Prakash and Kollman (2004)), there is an implied need for greater support/collaboration from stakeholders to encourage continued GSPs adoption. This research through these findings contribute to both academic and practice having identified and filled the research gap as well as the practical implication of these two approaches.

## **5.5 WHAT THEORY SUFFICIENTLY EXPLAINS GREEN SHIPPING PRACTICE ADOPTION?**

This section discusses the four theories identified through literature review as possible explanation for GSPs adoption. The four theories are institutional theory, resource base view, complexity theory and stakeholder theory. These theories are discussed below in details through the identification elements of these theories present within the data obtained from the case organisation and conclusion is drawn based on robust discussion.

### **5.5.1 COMPLEXITY THEORY AND GREEN SHIPPING PRACTICE ADOPTION**

From the literature review complexity theory was discussed highlighting its plausibility for explaining GSP adoption. Complexity theory suggests that “firms operate in a system that includes both order and disorder (Prigogine, 1984), where interactions of the involved parties will determine the performance outcomes of the system” (Sarkis et al., 2011). Chakravarty, (1997) highlighted

that with respect to organisational complexity on environmental issues, it can be explained through diversity or heterogeneity amongst factors that influence organisational decisions (customers, suppliers, government regulations, and technology). It is further expected that increasing complexity increases the difficulty with which the organisation is able to plan and predict its actions e.g. the adoption of green practices. Evidence of application of this theory to environmental issues has been presented in the literature review chapter (Choi and Krause (2006); Shi et al., (2010); Vachon and Klassen, (2006b); Koufteros et al., 2007); Yang, (2010)). From the data collected six factors were identified to be responsible for GSPs adoption. These six factors are; customer influence, professionalism, moral conviction/values, regulatory influence, competitor influence and leadership and managerial support. These factors may be said to be diverse as some of them are from within the organisation and other are from outside. As has been previously highlighted complexity of decision making is expected to increase with increasing number of factors. This does not appear to be the case here as all factors although very different and from differing sources seem to have a homogenous effect in GSPs adoption. This complexity is even more expected when factors like size and interrelations with other entities are taken into consideration (Vachon and Klassen, (2006b); Guide and Wassenhove, (2009); Matos and Hall, (2007) leading to near impossibility in the predictability of outcomes (Bai and Sarkis, 2010a). In this instance, complexity theory does not seem to be effective in explain GSPs adoption nor the impact on organisational performance. While there are very diverse factors contributing to the adoption of GSPs, they do not appear to create any form of complexity neither does this have an unpredictability effect on the outcomes. This research through the data

collected identified outcomes (perceived benefits and constraints) of GSPs adoption as reported by the respondents. The evidence in this research does not appear to suggest the influence of diversity or heterogeneity of the identified factors hence complexity theory does not suffice as a plausible theory for the explanation of GSPs adoption.

### **5.5.2 INSTITUTIONAL THEORY AND GREEN SHIPPING PRACTICE ADOPTION**

DiMaggio & Powell, (1983) introduced institutional theory describing organisations as institutions that behave in a certain way in response to certain institutional forces/influences. They identified three institutional influences/forces; coercive influence, mimetic influence and normative influences. Coercive influences are usually from entities upon which the organisation depends for resources while normative forces arise from industry norms. Mimetic influences are due to firms replicating the success of other firms/competitors during uncertain times. This research identified factors responsible for the adoption of GSPs. In the previous section, they were described as Drivers and Enhancer as a function of the extent of influence they exert. In this section, they are considered in respect of what institutional force/pressure they may represent. As previously mentioned, six factors were identified to be responsible for GSPs adoption. These six factors are: customer influence, professionalism, competitor influence, leadership & managerial support, moral conviction/values and regulatory influence. From the definitions of institutional forces/influences given above, Customer influence and

Regulatory influence are typically coercive influences as several researches have also identified (Evangelista P, (2014); Hoejmose et al, (2014); Keui et al (2015), Har, Abdul and Nee (2013); Etzion (2017); Chou, Chen and Wang (2012); Lin and Ho (2011)). Professionalism and Leadership & Managerial support are usually normative influence (Tate et al (2010); Zhu and Sarkis (2007); Lin and Ho (2011); Carter et al., (2000); Ball and Craig (2010); Harris, (2006); Christmann and Taylor, (2001)) while the influence of Competitors are considered Mimetic (Christmann and Taylor, 2001); Zhu and Liu, (2010); Zhu et al (2007); Aerts et al., (2006)). The influence of Morals and Values on the Green Practice Adoption decision has not been previously considered in literature hence this research having discovered this factor does extend the existing body of knowledge. Customer influence was described as the foremost influence on GSPs adoption. The respondents in this research, described the influence of customers as coercive through increasing demands that are placed on shipping firms to be more environmentally friendly. This increasing demands was associated with increased customer awareness hence their increased influence of GSPs adoption. These findings agree with the many literature on similar green practices some of which has been cited above. Similarly, Regulatory influence was observed to be coercive in instances where regulatory authorities were effective hence driving the adoption of GSPs. This finding is also in agreement in literature. Leadership and Managerial Influence followed a similar exerting normative influence on GSPs adoption through support for Green Initiative. Competitor influence was also seen to agree with existing literature exerting an ever so minimal supporting influence on GSPs adoption. Professionalism however appeared to vary from what has been previously obtained in literature. The usual normative

influence is observed in the research to also be partly coercive. The data revealed that professionalism appears to exist in three main dimensions and on two levels. It can be argued that this may be the first time that such a pattern is observed. The three dimensions of professionalism manifest through organisational professional affiliations and Certifications also at the organisational level. The third dimension is through environmentally related education and years of work experience which played out mainly at an individual level. These two level of influence were observed to exert different types of influences. Professionalism at the organisational level seemed to exert coercive influence as professional institutions which the firms belonged to were seen to exert great regulatory influence similar to those of governments and other regulatory authorities. It is argued in this research that such influence is possible due to the size and prowess of these professional institutions whose influence span across the globe and has some of the world's biggest brands as members. The second level of professional influence was seen to manifest at an individual level where formal education in Environmentally related areas served as an Enhancer/Supporter of GSPs adoption in which case the normative influence of Professionalism is seen. This finding is particularly insightful as such a trend has not been observed in existing literature. This has academic and practical significance and can foster increased collaboration between academia and practice towards the development on more practice oriented studies to enhance green practice adoption. Furthermore, the usual scuffle between governments and large corporations can be minimised if government can take advantage of the observed existing coercive influence exerted by professional institutions by delegating regulatory powers to such bodies hence exerting their regulatory

influence through these institutions with whom shipping firms already have an allegiance.

Having discussed the institutional theory considering the factors identified to influence GSPs adoption, it is safe to conclude that it substantially explains the adoption of GSPs being accountable for five of the factors identified. Morals convictions/value has been identified as an additional factor influencing the adoption of GSPs. This is the first time that this factors has been identified hence it is proposed here as an extension of institutional theory as will be seen in the conceptual framework in subsequent sections.

### **5.5.3 RESOURCE BASED VIEW AND GREEN SHIPPING PRACTICE ADOPTION**

The possibility of RBV as a sufficient theory to explain GSPs is discussed in this section. The resource based model of competitive advantage as put forward by Barney, (1991) suggests that a firm may gain competitive advantage by “harnessing its resources that are valuable, rare, imperfectly imitable, and non-substitutable.” Together with Daft, (1983) firms’ resources were described as knowledge, information, firm attributes, organizational processes and capabilities, and assets within the organisations’ control that avails it the ability to develop and deploy strategies that help it improve its competitiveness (improve efficiency and effectiveness). Sarkis et al (2011) further highlighted that improvements observed in organisational performance can easily be attributed to development of the organisation’s capabilities and resources.

Evidence of application of RBV in environmental management have been discussed in the literature review section (Carter and Carter, (1998); Vachon and Klassen, (2006b); Forstl et al., (2010); Sarkis et al., (2011)). This section examines the factors identified to be responsible for GSPs adoption within the scope of RBV to establish the suitability of RBV as a theoretical explanation of GSPs adoption. Of the six factors identified to influence GSPs adoption (customer influence, professionalism, moral conviction/values, regulatory influence, competitor influence and leadership and managerial support) only three can be emphatically categorised as unique organisational resources or capabilities. These three are professionalism, leadership and managerial support which are reasonably unique assets based on human capital of the organisation and one that is rarely replicable and moral conviction/values which can be considered a subset of the first two. While these three are arguably unique capabilities and resources possibly offering competitive advantage, they only account for half of the factors identified to influence GSPs adoption. Additionally, moral convictions/values and leadership & managerial support were found to only exert a support influence and not a driver influence hence not directly causing GSPs adoption but only a complimentary factor for GSPs adoption. Traces of such influence were also found in professionalism at the individual level. This further delimits the possibility of RBV to sufficiently explain the adoption of GSPs. The evidence obtained from the data collected identified six factors as responsible for GSPs adoption. RBV only accounts for three of these factors which also appear to only have a supporting/enhancing role in GSPs adoption. Taking this into considering, it cannot be concluded that RBV sufficiently explains GSP adoption.

#### **5.5.4 STAKEHOLDER THEORY AND GREEN SHIPPING PRACTICE ADOPTION**

Stakeholder theory is being examined here as a theory sufficient to explain GSPs adoption. This theory is examined considering the factors identified to be responsible for GSP adoption. Freeman, (1984) defined stakeholders as any “any group or individual who can affect or is affected by the achievement of an organization’s objectives”. Adopting this definition, Stakeholder theory thus suggest that organisational actions impact in some way on several parties (stakeholders) some of which are within and outside the organisation; this in turn causes the stakeholder to pressurise the organisation into minimising its negative activities and improving its positive ones (Sarkis et al., 2011). This definition suggests a reactive approach as to GSPs adoption as some of the evidence from this research demonstrates hence response to pressure from stakeholder groups (customers, regulatory authorities, professional institutions). There have been several categorisations of stakeholders in literature some of which include direct and indirect, urgency and power, primary and secondary and based on the dimensions of legitimacy (Mitchell et al., (1997); Delmas, (2001, 2002); Delmas and Toffel, (2004)) hence there have been a good number of application of the theory. Evidence of application of Stakeholder theory to environmental practices have been discussed in the literature review section (green purchasing (Bjorklund, in press; Maignan and McAlister, 2003); reverse logistics (Sarkis et al., 2010); green logistics, Supply chain life cycle analysis and Green Supply chain (Matos and Hall, (2007); Zhu et al., (2008); Chien and Shih, (2007); Gonza’lez-Benito and Gonza’lez-Benito, (2006)) (de Brito et al., 2008) (Sarkis et al., 2011)). It was also duly noted that some aspects of the Stakeholder



theory may overlap with those of institutional theory particularly where norms and legitimacy are discussed (Sarkis et al., 2011) as these are predominantly dependent on group(s) of individuals with specific interest and/or stake in the organisation however there are still distinctions e.g. the presence of competitors' influence which can influence organisations' decisions but not necessarily by pressurising the organisation; furthermore, while competitors can be affected by an organisations decisions and vice versa, neither have a stake (hold) on the other. Considering the factors identified to influence GSPs adoption (customer influence, professionalism, moral conviction/values, regulatory influence, competitor influence and leadership and managerial support), four of them can be considered as stakeholder influences namely; customers, regulatory authorities, professional bodies and organisational leadership and management. Moral conviction/value is somewhat a sub-function of professionalism since the respondents were observed to have environmentally related education influenced their decision to adopt GSPs hence may be classified as a Stakeholder influence however, since this is the first time this factors is being identified, such a conclusion is arguable hence it is considered otherwise. It was previously highlighted that customers cannot be classified as stakeholders. This is because, even though they can exert competitive (mimetic) pressures on organisations which may influence organisational decision, competitors do not have a stake (hold) on the organisation hence cannot pressurise organisations into desired decisions as other identified stakeholders would. It is also need also needful to also examine the type of influence (driver or enhancer/supporting) that these factors exert GSPs adoption. The data suggest that customers, regulatory authorities, professionalism all exert driver influences on GSPs adoption.

Additionally, regulatory authorities, professionalism, and leadership & management support also exert complimentary enhancer/supporting influence. Taking this discussion into consideration, Stakeholder theory reasonably accounts for four of the six factors identified to drive GSPs adoption. It does not account for the influence of competitors and since this is the first-time moral convictions and values have been identified to influence GPA it cannot be conclude to be an element of stakeholder theory.

#### **5.6 WHAT IS THE EFFECT OF THE ADOPTION OF GSPS ON FIRM PERFORMANCE (SERVICE & FINANCIAL PERFORMANCE)?**

The final research question set out at the start of the research sort to identify the impact of GSPs adoption on firm performance. Klassen and McLaughlin, (1996); Melnyk et al., (2003); Montabon et al., (2007); Venus (2011); Hofer et al., (2012) all through their research have established a link between environmental practices and firm performance mostly highlighting that firm performance improved. Rao, 2002; Rao and Holt, (2005); Laosirihongthong et al., (2013) also stressed the importance of understanding the relationship between environmental practices and firm performance to reap the full benefit of such activities. This research examined the impact of GSPs adoption on firm performance. Two aspect of impact on organisational performance was examined. The first impact is the perceived benefit of GSPs adoption and the other being the perceived constraints. The perceived benefits are the positive impacts that the respondents reported to occur because of GSPs adoption while the perceived constraints are the seemingly negative impact of GSPs adoption on the firms' performance.

Four main perceived benefits were identified namely; competitive advantage, cost savings, reputation & marketing strategy and Improved process efficiency and green performance. Competitive Advantage is perceived exist due to improving green capability which helps the firm compete with other global brands as being green is increasing becoming a global business culture. The research further showed that the respondents perceived being green it as a unique selling point which helps them retain existing clients as well as reach out to new ones citing an instance where demonstration of green capability improved their negotiating position during a contract bid. This finding is supported by Kimberly and Evanisko, (1981); Damanpour, (1991); Deng and Wang, (1998); Zhu and Weyant, (2003); Murphy and Poist, (2003); Gonzalez-Benito and Gonzalez-Benito, (2006a); Zhu et al. (2007); Sarkis et al. (2011); (Buyukozkan and Cifci, (2012); Hofer et al, (2012) whom have obtained similar findings in other industry sectors. Furthermore, Cost Savings is perceived to accrue due to efforts to reduce GHG emissions/carbon footprints which means a conscious effort to minimise fuel consumption hence the associated cost. It has been severally stated in literature that bunker cost is an enormous cost in shipping (Ronen (1982, 2011); Sheng et al. (2014); Yin et al. (2014)) hence any opportunity to minimise fuel consumption as is the case in GSPs adoption is considered a benefit. Cost savings is also realised through adherence to regulation which save firms from fines and other related cost. Additionally, cost saving is closely identified with efficiency through optimal energy use and improved process all of which is somewhat is perceived to translate to cost saving. Similar opinion exists in literature (Curkovic et al., (2000); Zhu and

Sarkis, (2004, 2007); Wu and Pagell, (2011); Laosirihongthong et al., (2013)). Reputation and Marketing Strategy as previous research (Barney, (1991); Welford, (1995); Carter et al., (2000); Sarkis, (2009); Forstl et al., (2010); Sarkis et al, (2011); Lun et al. (2015)) in other industry sectors have identified is also perceived to be a benefit of GSPs adoption. The respondents opined that being green made them a more likeable company, improved their corporate image and made them more globally recognised which in turn resulted in improved global competitiveness. Lastly Improved Process Efficiency and Green Performance was reported to be achieved through optimal processes and the use of light fuels which increases profitability. Environmental performance was stated to have improved with the respondents citing how much improvements they have made over a reasonably short time span. Existing studies also show this to be true for other industry sectors as the works of Welford, (1992), Hart and Ahuja, (1996); Zhu et al., (2007); Viana et al., (2009); Chang, (2012); Lai et al., (2013) Kuei et al., (2015); Zhu et al., (2007); Seuring and Muller, (2008); Chow and Chen, (2012); Kuei et al., (2013) all show.

In contrast to the benefits stated above, this research also identified constraints to GSPs adoption. Two main constraints were identified: unlevelled competitiveness due to lax regulatory influence and cost of GSPs adoption. The former constraint is perceived to unevenly tilt the competition against the said shipping firms having decided to be environmentally responsible in a context where sustainability is not a business culture while emphasised that investing in sustainability is a continuous endeavour. These investments are said to be usually huge and may be quite discouraging at the initial stages. To the

knowledge of the author not many have specifically discussed constraint to GPA hence this research extends existing knowledge in this regards having identified specific constrains. These findings are also particularly useful to the shipping industry and its stake holders as it highlights areas of concentration/problems which when addressed can greatly impact GSPs adoption hence increasing the benefits thus.

The table below (Table 5.1) presents a summary of the findings in this research. The findings are in turn answers to the research questions. Furthermore, the practical implications of the research have been included in the table. This provides insight to managers as well as policy makers whom will find this research useful for designing and implementing a framework to enhance the adoption of GSPs. The table in total holds five research questions with corresponding findings section and implications.

<b>Research Questions</b>	<b>Findings</b>	<b>Implication</b>
1. What is the understanding of GSPs in industry?	The industry understanding of GSPs is in line with the conceptualised definition in literature. The respondents defined GSPs as all activities that minimise negative	The Implication of this is the gap between theory and practice is observed to be minimal hence academia can further cooperate with industry to enhance GSPs adoption.

	<p>environmental impact of shipping operations.</p> <p>Furthermore, the five dimensions of GSPs as conceptualised in literature were validated.</p>	
2. Why are shipping firms beginning to adopt certain GSPs?	<p>This research identified six factors to be responsible for GSPs adoption one of which is a only being identified for the first time in literature.</p>	<p>This knowledge sensitises industry practitioners on the individual factors influencing the adoption of GSPs helping to build a greater understanding of GSPs adoption.</p>
3. Is the adoption of GSPs a Proactive or a Reactive Approach?	<p>The findings indicate that GSPs is both reactive and proactive.</p>	<p>There is a need for continued regulatory stringency and cooperative efforts to enforce lax aspect of GSPs adoption as well as provide support to encourage voluntary actions of shipping firms.</p>
4. What theory	<p>Four theories were</p>	<p>The knowledge and</p>

substantially explain GSPs adoption?	examined and it was concluded that Institutional theory provided the most substantial with an extension to include the additional factor identified.	understanding of Institutional forces and how they drive GSPs adoption provide Industry practitioners with insights into the internal and external motivational factors and how to take advantage of it for further diffusion of GSPs adoption possible through updated regulatory framework.
5. What is the effect of the adoption of GSPs on firm performance?	This research identified outcomes of GSPs as perceived benefits and constraints.	The knowledge and acknowledgement of perceived benefits and constraints of GSPs can be used to further encourage shipping firms as well as develop strategies to minimise the constraints.

**Table 5.1 Summary of findings on the research questions**

## 5.7 CONCEPTUAL FRAMEWORK FOR GREEN SHIPPING PRACTICES ADOPTION

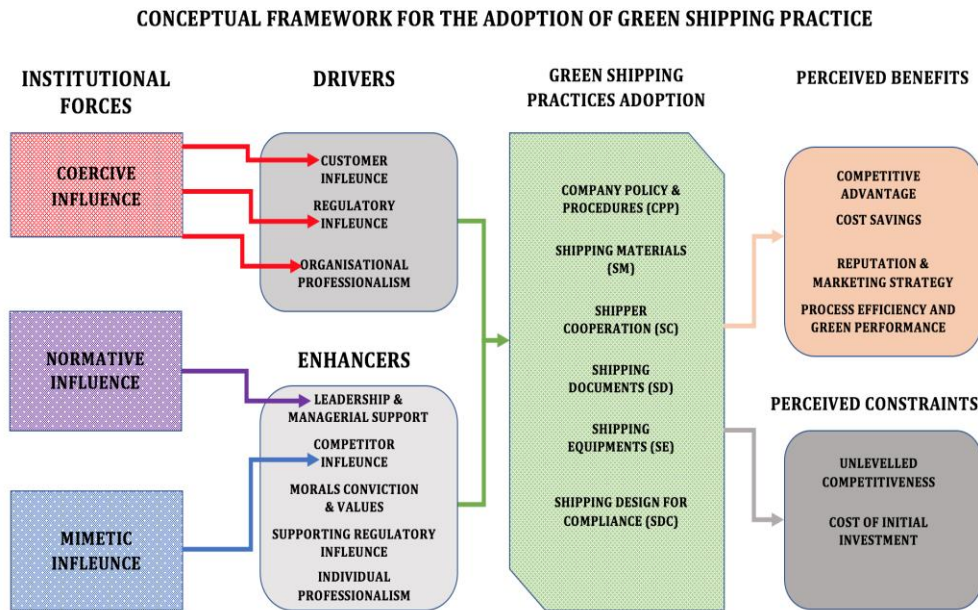


Figure 5.1 Conceptual Framework for the adoption of Green Shipping Practices (Personal Collection)

The Figure above (Fig 5.1) is the conceptual framework for the adoption of GSPs. It summarises all the findings in this research detailing the identified institutional forces identified to influence GSPs adoption with the specific elements of these forces (factors), the six dimensions of GSP adoption validated through data collection as well as the perceived benefits and constraints of GSPs adoption as reported by the respondents. The description of the framework is as follows; the framework highlights that coercive forces are largely responsible for GSPs adoption the influence of which is seen through three of the factors (Customer demands, regulatory influence and professionalism). Mimetic and Normative forces are seen to Enhance GSPs adoption. Additionally, this research identified that the observed factors had different extent of influence leading to



the categorisation of some of them as Drivers being those that are directly responsible for GSPs adoption and others as Enhancers being those that only supported GSPs adoption. The Drivers and Enhancers exerting different levels of influence jointly result in GSPs adoption characterized by the six dimensions as seen in the diagram. The resultant effect of GSPs adoption is described in two categories namely perceived benefits and constraint. Four perceived benefits were identified by this research and two constraints as shown in the diagram. The diagram gives a snapshot of this thesis providing a simple easily comprehensible representation of the finding of this research.

## **5.8 CONCLUSION**

The findings from the research revealed that there is a growing understanding of GSPs in the industry and that GSPs is still in its early days. This is not surprising as the earliest specific literature on Green Shipping was only published in 2011 by Lai et al and the earliest known Green shipping activity in practice is very well under ten years as opined by the respondents. Lai et al., (2011) proposed a conceptual proposition of GSPs definition and a conceptualization of six dimensions to encompass all GSPs activities. These six dimensions are; Company policy and procedure (CPP), Shipping documentation (SD), Shipping equipment (SE), Shipper cooperation (SC), Shipping materials (SM), Shipping design and compliance (SDC) all of which the research confirms to exists in practice although to different extents. Another interesting finding was that the knowledge of GSPs seemed to depreciate with increasing distance from the core hence the further away the job functions of the respondent from interaction with the environmental functions, the less they seemed to know about GSPs. This further

highlight that GSPs adoption is still in the budding phase and there is need for increased effort to ensure further GSPs diffusion. Additionally, the respondents highlighted the need for cooperation between internal and external stakeholders to reap the full benefits of GSPs adoption.

This research through the data collected has validated the previously conceptualised definition of GSPs having compared the academic definitions with that obtainable in practice. This research confirms that the understanding/definition in practice is similar to that in literature. Hence this research has contributed to shipping literature by validating the conceptual proposition of GSPs definition and dimensions. Additionally, trends related to GSPs diffusion were also identified and discussed which had not been previously considered in literature. The understanding of GSPs has profound implication for practices as it helps to further ground GSPs practices and avails practitioners to garner academic support to drive further GSPs adoption.

## **6 CONCLUSIONS, FUTURE RESEARCH AND MANAGERIAL RECOMMENDATIONS**

### **6.1 CHAPTER OVERVIEW**

This chapter presents a summary of the thesis, a concise version of the discussions and conclusion drawn from the thesis. The chapter then goes on to present areas for future research, contribution (theoretical, methodological and practical).

### **6.2 THESIS OVERVIEW**

This section presents an overview of the thesis. Chapter one of the thesis introduces the research aim and objective with a description of the research context highlighting the research gap and establishing justification for the research in section 1.2 which is also further elaborated in sections 2.. Chapter two presents a literature review and theoretical frameworks of the research highlighting theories identified to likely explain GSPs adoption with examples of their application to similar research. Chapter three discusses the methodology chosen for the research. Qualitative research methodology was chosen for this research working through an inductive approach and interviews were used as the data collection technique. In Chapter four, the data collected was presented and analysed resulting in findings that filled research gaps identified in chapter one. The fifth chapter discussed the findings in respect of the research questions set out at the start of the research providing direct answers to the research questions highlight where findings agreed with literature and where they differed giving possible reasons for the observed variation. This concluding

chapter summarises the thesis highlighting how the objectives set out at the beginning of the research have been met.

GSPs are considered a new and increasing trend in the shipping industry and very little is known about what drives this trend. More so, the first literature on the subject was only published by Lai et al., (2011). Through this research, the mystery behind the motivation for the adoption of GSP amongst shipping firms has been unravelled. Possible theoretical perspectives to GSPs adoption were examined leading to the conclusion that Institutional theory substantially explains GSPs adoption with the inclusion of a previously undiscovered factor (moral convictions/values) which was found to have an enhancing/supporting influence on GSPs adoption. Furthermore, the impact of the adoption of GSPs on firm performance was also examined giving rise to perceived benefits and constraints. The accumulated knowledge from this research contributes to literature filling the research gap in GSP literature; furthermore, it is useful for the development of a systematic framework for the adoption of GSPs. The understanding of the driving force of GSPs is beneficial for the development of business friendly environmental regulations which will also encourage firms to partake in such practices.

This research adopted an exploratory case study approach to research what factors drive the adoption of GSPs in the shipping industry. Understanding these factors is vital to the success of GSPs adoption and implementation. The complexity of the shipping industry was envisaged to alter the replication of any existing adoption systems or environmental management practices in other sectors. This variation

was observed in certain instances. Justification for the adopted methodology has been provided in the methodology section, which largely includes the fact that the area being research is relatively new and there are not many literature and data amongst other reasons.

Institutional theory which has been found to be very useful in helping to understanding adoption of environmental practices in other sectors has been found to through this research to provide substantial explanation for the adoption of GSPs. Institutional theory provides a holistic view of the pressures that can influence organizational practices/behaviours, it was the interest of this research to find out if these pressures are responsible for the adoption of GSPs and if not what exactly drives the adoption of GSPs and how adoption of GSPs affects firm performance. This research confirmed that Institutional theory sufficiently explains GSPs adoption. The research also identified one factor outside of those explained by institutional theory which had a significant influence on GSPs adoption. The results obtained sufficiently answered the research questions as can be seen in the preceding chapter. Hence this research has met its aim having identified the factors responsible for GSPs adoption and the impact on organisational performance.

The table below (Table 6.1) presents a summary of contribution of this research. It consists of identified research gap from literature, advances to knowledge and new contribution of the study. Three main research gaps were identified by this study to which advances were made as well as new contributions. This Study increased knowledge about GSPs adoption highlighting factors influencing

adoption of GSPs as well as the impact on organisational performance as well as suggested Institutional theory as substantial for the explanation of GSPs adoption. Finally, this research further suggests an extension of institutional theory to include an additional factor that had not been previously identified in literature to influence green practices adoption hence extension of Institutional theory is a theoretical contribution of this research.

<b>Identified gap in Literature</b>	<b>Advances to Existing Knowledge made by this study</b>	<b>New Contribution made by this Study</b>
There was no previous empirical work on GSPs understanding, factors driving adoption and possible impact on organisational performance in the shipping industry.	This work provided validation for previous conceptual definitions and dimension of GSPs.	This Study increased knowledge about GSPs adoption highlighting factors influencing adoption of GSPs as well as the impact on organisational performance.
Most work on green and environmental practices make use of a quantitative approach.	This work explored a qualitative approach taking advantage of the in-depth and robust framework it avails to study a budding area of	This approach provided a depth of understanding that had not been previously explored as new insights were unearth during some of

	<p>research. In a good number of instances, findings were similar to those from previous study further affirming previous findings while in other instances the findings varied.</p>	<p>the data analysis as a result of the approach taken.</p>
<p>There was no previous theoretical application explanation for GSPs adoption.</p>	<p>This research explored discussions around four theories to identify that which substantially explains GSPs adoption. Institutional theory was suggested as a substantial theory to explain GSPs adoption</p>	<p>This research suggested Institutional theory as substantial for the explanation of GSPs adoption.</p> <p>This research further suggests an extension of institutional theory to include an additional factor that had not been previously identified in literature to influence green practices adoption hence extension of Institutional theory is a theoretical contribution</p>

		of this research.
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Table 6.1 Summary of Contribution

### 6.3 LIMITATIONS AND FUTURE RESEARCH

This exploratory study has examined GSPs practice adoption and its impact on the performance of shipping firms an area of research that had not been previously explored. Good insights have been developed in this research through the identification of factors influencing the adoption of GSPS. Furthermore, Institutional theory has been suggested to substantially explain GSPs adoption following the examination of four plausible theories. The discussions presented in this research are interesting and should be pondered upon with an open mind, it is the expectation of the author that this research will trigger further discussions in this regard. For further studies, the author recommends a replication of this study later through a quantitative methodology. Findings from these can further establish the present findings being tested on a wider population. Secondly, institutional theory has been suggested to substantially explain the adoption of GSPs, it would be erroneous to assume that this is absolute. The author therefore recommends the examination of other theories (e.g. Technology Acceptance Model (TAM)) that might provide more understanding than that already provided here. Greater possible even exist where two or more models or theories can be combined to present a more robust understanding of GSPs adoption. As this is a premier research in this aspect of green practice adoption, the possibilities of streams of contributions are almost endless.



This research is not without limitations, firstly the research plied a qualitative route making use of case study strategy. One usual limitation of Case study research is generalisability as case studies seek to proffer generalisations from specific instances. It is needful to note here that “case studies, like experiments, are generalisable to theoretical propositions and not to populations or universes hence it does not represent a "sample," and the investigator's goal is to expand and generalise theories (analytic generalisation) and not to enumerate frequencies (statistical generalisation)” (Yin, 1996; pp 10). This was the case in this research. It is possible that other research strategies e.g. surveys can provide statistical generalisation that is lacking in this research. Furthermore, this research does not claim in absolution that institutional theory is the best fit for explaining GSPs adoption, it merely suggests it as a substantial theoretical explanation for the said phenomenon. There exists enormous possibility of other promising theories such as Diffusion of innovation theory and Social embeddedness theory to provide greater understanding of the of the forces influencing GSPs adoption. This research through the data collected has been able to launch the theoretical discussions on GSPs adoption and further possibilities exists for continued research.

#### **6.4 MANAGERIAL IMPLICATIONS AND RECOMMENDATIONS**

This research having identified proximity between industry and academic understanding of GSPs as well as the impact of environmentally related education influencing the adoption of GSPs thus recommends increased industry and academic partnership particularly in the development of theory driven solutions with ease of application. Increased collaboration between both parties

can help to achieve a quicker diffusion of GSPs. Furthermore, the understanding of the profound influence of professional bodies can be utilised to further drive GSPs adoption as the need for legitimacy easily coerce organisational into continued allegiance. Such allegiance can be used by the government to increase regulatory influence. The knowledge of the identified perceived benefits and constraints can be used to develop strategies that provide incentives and support to shipping firms to further encourage GSPs adoption.

## **6.5 THEORETICAL CONTRIBUTION**

This research examined four theoretical perspectives that have been robustly used in operations management and Green Practices as possible explanation for GSP adoption. These four are RBV, Complexity theory, Stake holder theory and Institutional Theory. The fundamental of all four were examined and compared to the observed findings in Green shipping practices. Institutional theory was observed to account for a good majority of the factors identified to influence GSPs adoption. This is first theoretical contribution of this research as no previous research had empirically validated the explanation of any theory as responsible for GSPs adoption. Additionally, Moral conviction/Values was observed to also influence GSPs adoption in industry. Institutional theory does not fundamentally account for Moral convictions/values in its dimensions hence this research proposed an extension of Institutional theory to include this additional factor as has been included in the conceptual framework presented in the discussion chapter. Further theoretical contributions include the observation of professional bodies that would typically exert normative influence appearing to exert coercive influence in this instance. It is argued in this research that the size, variation/scope of membership (world renowned brands etc.) of

professional bodies could translate their typical normative influence into coercive driving member organisations to adhere to its regulations in return for continued membership and legitimacy.

## **6.6 METHODOLOGICAL CONTRIBUTION**

This research explored the use of qualitative methodology as opposed to the vast array of quantitative studies on similar subject areas as has been highlighted in the literature review. This reason for this approach was justified by its applicability to budding areas of research where neither literature or data abound as is the case with GSPs. Additionally, the emphatic strength of the qualitative approach providing in-depth understanding of the researched area was helpful in identifying and understanding the factors responsible for GSPs with insight of how adoption occurs. Some of the profound insight generated include the possibility of professionalism existing on two levels (organisational and individual). This increases knowledge on Institutional theory. Furthermore, it was observed that although coercive influences were largely responsible for driving GSPs adoption, there existing subtle replications of these influences as enhancers also. These types of insights could only have been obtained through a methodology that allows for in-depth content analysis as the chosen methodology avails.

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## APPENDIX

### INTERVIEW SAMPLE 1

*Good morning and thank you for participating in my research.*

Thank you.

*Like I said initially, the research is to understand the factors that influence the adoption of GSP in the shipping industry and I'm interviewing you based on your expertise in the area. Are you happy to go ahead with this interview?*

Yea sure

*Thank you very much, the first set of questions I'll be asking focusses on the definition and understanding of GSPs. So the first question is:*

*What is your understanding/definition of GSPs?*

For me it's all action you do to reduce your environmental impact, so it is every effort to minimize the negative impact of shipping activities on the environment...

*So whether it is technological or through business practices?*

Yes, it means all efforts

*What Green Shipping Practices do you have in Place?*

Firstly, we are a member of CCWG, which is dedicated to reducing carbon emission and other forms of emissions, which have negative impact on the environment. We are also trying to reduce our fuel consumption in order to reduce our carbon footprint. We don't have specific programs to achieve this. It is a new concept for us and we are still in the learning phase (my company and I too) but becoming a member of CCWG is a big impact in trying to reduce our emission and trying to be more transparent in the operations of our vessels.

*So generally you're still learning the process? YEA*

*I appreciate the fact that you say it's new initiative, is that a new initiative for your company or for the shipping industry as a whole?*

For the shipping industry it is about 8 to 10 year but for us it is very new and in turkey it is really new as well. It is only about 2 to 2.5 years and we are currently the only company practicing GSP as well as being a member of CCWG also.

*Is the adoption of GSPs Reactive or Proactive? Explain?*

Actually, I believe it is both a reactive and proactive approach because we have customers that are placing demands for us to be environmentally responsible but also our efforts to reduce our carbon emissions also means cost savings on our part. In the shipping industry, the main cost is the vessel rent and bunker consumption, if you are able to reduce your bunker consumption, it directly impacts your carbon emission, we actually started to do this before joining CCWG (about 4 to 5 years ago) but after joining, we do it in a more standardized manner (according to laid down rules).



So do you have regulations that guide you?

Yes, CCWG have some rules and regulations and we follow them.

Is green shipping common/widely acceptable in the shipping Industry?

Yes it is a big trend; all the big shipping companies are into green shipping. The top 25 companies are already doing very well in Green shipping and they have all made remarkable achievements (Maersk, MSC, CMA). So now it is a commonly accepted practice? Yea

Is there a defined department for Environmental Management? How does this department function? To what extent?

Well, for our company, we don't have different department for this because it is very new and we are not as big as other global shipping companies that have implemented this practice but we have a position/office that oversees this aspect and that's me. My position is Environmental Policies Specialists.

Actually, There are global trends in GSP and environmental protection, so I try to follow these trends and in doing so I need to read, learn and then act according to the things I have learnt. I also coordinate the relations between CCWG and my company and that about it for now. It is a very big responsibility.

How is GSPs monitored? Reported? Improved?

We have specific and standard ways of measuring our environmental performance. It is usually filled after every voyage. Each vessel completes these standardized sheets and we monitor our fuel consumption, distances and all operational specifications of the voyage and then we report to CCWG and they calculate according to IMO and other regulations and they give us our score.

How would you assess your improvement/performance?

We have only reported our performance twice, and our CO2 emission has improved by about 3% and we also calculate our performance in house and from 2011 to 2015 we have made a 12.5% improvement in 4.5 years.

Do you have target for your Green Efforts? What are these targets and how well are you performing?

Yes we set targets, and in fact it is one of the rules of CCWG, you need to set targets and try to achieve them. Our target is to achieve 20% reduction by 2020.

And how well are you performing?

I think we can achieve it and from my opinion it think we can surpass it.

Who are the major competitors to your organization? Are you aware of GSPs adoption/implementation in these organizations? Did this influence your decision to adopt GSPs?

For my firm, we don't have any major competitors in Turkey, we are the biggest company but globally, there is MSC, CMA, Maersk, Ever Green, and NYK.

Actually all these companies are also a member of CCWG and we meet twice a year and are very familiar with each other's practices. **So is this part of the reason why you also joined CCWG and start Green Practices?** Yes. **So the fact that you are trying to compete globally and be recognized as firm that has international standards did influence your decision to adopt GSP?** Yes.

**What is the leadership's perception to GSPs? (Supportive/Indifferent/ Non-supportive) Explain....**

In Turkey we are the first and the only one, we always want to be the leaders in the shipping practices and after we joined CCWG another company in turkey joined but for only a short while. So we in a certain influence other companies to the more environmentally responsible.

Yea the leadership support GSP very strongly and being here in the UK at this time participating in this maritime emission reduction research project also shows their support. The fact that I am the only one overseeing this aspect of the company could have been enough reason for it to be undermined however the support has been enormous. SO they are very supportive.

**What is the managerial perception to GSPs? (Supportive/Indifferent/ Non-supportive) Explain....**

At the management level, I believe the entire top management level share the same opinion and support for Green Shipping. As you know we are a company that has several other business interests which include seaport operations and they have been recognized several with awards. They have also just recently replaced the ports traditional equipment with electrical ones in order to reduce negative environmental impact so it is not just good idea for our company; it is one that is pursued with great purpose. The chief executive largely supports this initiative and tries to extend it to other aspect of the business as well.

**In your opinion, are GSPs necessary?**

Yes, sure, every cares but the people who have the ability to influence and make positive impact need to act in a responsible manner. **So you feel very strongly about it?** YES.

**Do you feel a moral conviction to be environmentally responsible?**

Yes, it does feel good to do, it is a good business especially because typically, Shipping business is very dirty so to implement GSP and see its impact does give a sort of moral justification and satisfaction because you achieve something good not just for yourself but also the world at large.

**Do you belong to any professional organization? Which ones? Does this influence your perception on GSPs and environmental practices?**

Yea, CCWG is one of them and there are others but we participate in other environmental organizations (ECOVADIS), which are also a partner to CCWG, and they are trying to standardize the reporting of environmental performance. They are trying to development environmental performance ratings for shipping companies making use of grades similar to those already being used by other electronic equipment (A+, A- etc.)

Yes. It does influence our organizational perception to adopt and implement GSP. It widens our knowledge as we relate with other member organizations and this further strengthens our decision to implement GSP.

Are there any internal pressures to implement GSPs? What are these pressures? How do they influence the decision to adopt/implement GSPs?

No actually, there are no internal pressures. The biggest pressure is from our customers, there are no regulations as it well that makes environmental practices mandatory in turkey. The biggest pressures is from our customers.

What is the general opinion/perception of your colleagues to the implementation/adoption of GSPs?

They are all very supportive. I personally think that any person who loves life would naturally support this kind of initiative.

But you know sometimes people can just think it is a waste of time, so it's not like that in your company?

No, it's not like that, generally the staffs are very much in support of adoption and implementation of GSP.

What is the attitude of the government towards GSPs?

Well, they are very much in support and they also give some extras if you try to be environmentally responsible. **So there are incentives?** Yes there are for example, if you want to change your equipment in the port they give you some loans etc. so there are financial support that encourage shipping companies to be environmentally responsible. **How about tax reductions etc.** Yes I am aware that such facilities are in place but I am not very privy to such information as issues on finance are managed by other departments however I am very aware that the government is very much in support of the GSPs in Turkey.

What are the Environmental regulatory organizations overseeing the shipping industry and what are the binding regulations?

Yes there are standard rules and regulations, which we strive very hard to obey, for example; there are laws against burning Sulphur so we cannot burn bad bunker in coastal or port areas. **Is that from IMO or the Turkish government?** These regulations are from both. For example there are some special regulations that apply to the areas of straits and the Bosphorus and these regulations are very strict and there are punitive actions against violations. So yes, the government is very firm in enforcing these regulations.

Are there any punishment/fines/taxes imposed for violating Environmental regulations? The idea is how strong or how passionate is the government?

Yes there are very defined punitive actions in cases of violations of these regulations. These include fines, increased taxes etc. for examples if you use a lot of chlorophyll fuel in the restricted areas in turkey you get fined about \$25,000 for this action and while that may not seem like much it does accumulate into a large sum if you have to get fined at every port.

Do you consider these regulations effective?

Yes they are very effective, nobody wants to have to pay that amount in fines.

**Do these regulations influence your decision to implement GSPs?**

Not exactly, this doesn't quite affect/influence us because we already use highly quality fuels as well as have an instinctive motivation to be environmentally responsible so we don't receive any fines regarding these but it is good to know that the government support and enforces the implementation of GSPs.

**Are your customers aware of Green Practices?**

Yes, they are. Most of them are aware of GSPs and actually they want you to see proof of this either through membership of environmental organizations or through records of environmental performance. They even request to see their own environmental performance e.g. one of the major automotive companies (FIAT) would usually request to see ours and their own environmental performance. So for instance if they loaded 20,000 containers with us that year, they would want to know their environmental impact while we transport their cargo and we report to them their carbon footprint each year.

**So your customers are very aware of GSPs?** Yes they are very aware.

**So do they demand for environmental accountability as a matter of necessity?** Yes they demand for it, sometimes they make it mandatory that we must have proof of environmental responsibility (either through environmental impact records or membership of environmental organisations) as an organization before entering into any business relationship with us. A good example of such an organisation is Electrolux, which mandates that you have to be a member of CCWG in order to secure their patronage. So they are very strict.

**Do they demand for environmental accountability in your business practices? Does this influence your decision to adopt/implement GSPs?**

Yes, customer's demands largely influence our decision to adopt and implement GSP. In fact it is one of the biggest influences for us because we desire to remain in business with these customers as well as be able to compete with other global competitors.

**Are there any benefits for the adoption of GSPs for the organization? Explain**

Yes, there are benefits, which include getting new customers, reductions of bunker consumption is one of the huge benefits as well because bunker consumption is the biggest cost in shipping business and in our attempt to reduce our carbon footprint we have to consciously reduce our bunker consumption, which in turn amounts to reasonably cost saving for our company. So it is a win-win situation. Another benefit is the reputation that good environmental records avail us. It is a very good marketing strategy.

**Does this influence the decision of the organization to implement GSPs?**

Of course

Do you consider the adoption/implementation of GSPs a constraint to your operations/business?

I cannot particularly say it constrains our business however sometimes it is quite difficult to do especially in Turkey because we are about the only shipping firm in Turkey that is actively involved in GSPs and related practices. So it is difficult to achieve the similar results like our global competitors in this regards since we are about the largest shipping company in Turkey it is quite difficult to compete globally in this regard. Also it is somewhat unfair that we are the only one in Turkey having to expend resources in this regard, which in a certain way could amount to local disadvantage for our business.

What is your job description? How does it influence the adoption/implementation of GSPs?

Environmental Policies/Sustainability Specialist so I am responsible for all environmental and sustainability issues.

Do you have any certifications in the area of Environmental Sustainability?

Not certifications, but I have been trained as an Environmental Specialist.

What is the impact of GSPs on your business/operations?

Mostly asides cost savings; it improves our reputation and makes us able to compete globally. Being Green is one of the mandatory requirements for being a globally recognised shipping company. As a growing company, we have received some recognition for this.

What is the size and capacity of this firm?

Does this firm belong to any environmental organizations? Which ones? What role does this firm play in those organizations?

CCWG, ECOVADIS

We are not just members; we actually play an active role. I attend board meetings on behalf of my company twice a year and also we communicate monthly meeting online (Skype, email, etc.) and I am also actively participating in special task force groups within CCWG that are developed to address specific issues. So we are actively involved and as matter of fact CCWG ensures that all its members are active since they are not a commercial organisation. They are a voluntary organisation so the cooperative effort of its entire member is very important.

Does this firm have any environmental related certifications? Which ones? What led to obtaining this certification?

No, we don't have any certifications; some other parts of our shipping operations i.e. the Ports (MARPORT) have ISO certifications.

What is our highest level of education/ certification? University Graduate.

What is your Gender? M or F

Years of shipping service experience/business. 8 years



## **INTERVIEW SAMPLE 2**

### **DEFINITION AND UNDERSTANDING OF GSP**

What is your understanding/definition of GSPs?

What Green Shipping Practices do you have in Place?

Is the adoption of GSPs reactive or Proactive? Explain?

Is green shipping common/widely acceptable in the shipping Industry?

### **GSP MONITORING AND REPORTING**

Is there a defined department for Environmental Management? How does this department function? To what extent?

How is GSPs monitored? Reported? Improved?

Do you have target for your Green Efforts? What are these targets and how well are you performing?

Rate your environmental performance/effectiveness...

### **MIMETIC INFLUENCE**

Who are the major competitors to your organizations? Are you aware of GSPs adoption/implementation in these organizations? Did this influence your decision to adopt GSPs?

### **NORMATIVE INFLUENCE**

What is the leadership's perception to GSPs? (Supportive/Indifferent/ Non-supportive) Explain....

What is the managerial perception to GSPs? (Supportive/Indifferent/ Non-supportive) Explain

In your opinion, are GSPs necessary?

Do you feel a moral conviction to be environmentally responsible?

Do you belong to any professional organization? Which ones? Does this influence your perception on GSPs and environmental practices?

Are there any internal pressures to implement GSPs? What are these pressures?

How do they influence the decision to adopt/implement GSPs?

What is the general opinion/perception of your colleagues to the implementation/adoption of GSPs?

Rate their opinion.... (Supportive/Indifferent/ Non-supportive). Explain...

### **GOVERNMENT COERCIVE INFLUENCE**

What is the attitude of the government towards GSPs?

What are the Environmental regulatory organizations overseeing the shipping industry and what are the binding regulations?

Are there any punishment/fines/taxes imposed for violating Environmental regulations?

Do you consider these regulations effective?

Rate the effectiveness of these regulations...

Do these regulations influence your decision to implement GSPs?

### **CUSTOMER COERCIVE PRESSURE**

Are your customers aware of Green Practices?

Do they demand for environmental accountability in your business practices? Does this influence your decision to adopt/implement GSPs?

### **PERCEIVED BENEFITS & CONSTRAINTS OF GSP**

Are there any benefits for the adoption of GSPs for the organization? Explain

Does this influence the decision of the organization to implement GSPs?



Do you consider the adoption/implementation of GSPs a constraint to your operations/business?

Green shipping is quite a hot topic now.

My research is about understanding the factors that influence the adoption of GSP that is why shipping firms are beginning to adopt GSP and how does it affect shipping companies, is it an advantage or is it a constraint to them.

I see, I am more into the commercial part of the business; I am in the line management part, I am in the team that put together the global tenders with a view of global coverage as well as meet the demands of global shipping and of course one of the demands of global shipping is sustainability. I believe that is the reason Baran also gave you our contact details because ARKAS line is a regional carrier and we operate in Turkey and Turkey is not like the northern European countries that have very developed regulations. Turkey can be considered as a developing country, our economy is quite big but in comparison to western countries, we are still behind. So it is not really in our culture to be detailed about sustainability issues but we can say that in shipping and in other areas of business life, sustainability is growing as well but I don't know if it is fast enough but I can say not everybody has a fear of the future and about what is likely to happen if we continue the way we are going. These are my personal thoughts.

I think the reason why this change is coming in the shipping industry is because further away from the personal reasons and future of the world, I think it is pressure coming from the clients (global brands) due to globalization. Since globalization emerged about a decade ago connecting everyone, shipping lines became the main connector; more like a global highway in fact it is the main part of the global puzzle and moving containers from point A to B is the main part. The carbon emission created by this is a significant part of increase in global temperature (emission). Hence what became marketable is sustainability. Previously lower cost was more appealing to customers but in recent time the emphasis is on production of goods with the minimum resources possible hence making provision for future generations and this I believe started from the clients that we are shipping cargos, mostly clients from Northern Europe, Scandinavian countries and the United States. I think this came from their local regulations or research and marketing activities and eventually we see the big companies and globally recognised brands particularly from developed regions of the world, those that shipping thousands of containers enforcing and placing demands on shipping companies to adhere to environmental regulations (e.g. SECA) in order to secure their business or that you can show a continuous plan for your CO<sub>2</sub> emission reduction and that you are continuously investing and you can show proof and there are platforms that oversee environmental activities as this such as CCWG and ECOVADIS which we recently also joined. We as Arkas line see this as trend that is not going to disappear, it is only going to grow and become more and more demanding and the future is certainly paved in the sustainability direction so you have to keep investing in sustainability even

though you would have to incur extra cost however in the long run, it becomes obvious that this has benefits for us also because the more efficient our vessels and processes are (including selling and procuring), the more efficient and profitable we are as a company so this is one aspect of it that was generally accepted in the company and for a regional carrier of our size, I think we are ahead of many companies being very involved in sustainability platforms. I believe there are smaller regional carriers that are doing well too and I reckon they would be from northern Europe where being green is in the business culture and is a part their business life but for a Mediterranean based shipping company (outside of the SECA region) we are taking the necessary steps and we are on the right way.

I am happy that my contribution is helpful but it is necessary to note that not all clients take it as seriously, some clients just ask merely because it is part of their internal process and they really do not care about a proof or the quality/extent of our environmental activities. Others go much further by exercising their rights to perform an audit on you to see a valid proof of our environmental performance. It is also becoming common that some clients support us in our pursuit of environmental responsibility by providing financial incentives to us for being more environmentally responsible, these incentives are usually in the form of preferential consideration during contract bids e.g. If we happen to have the higher price quotes and equal service details as a competitor, we could be favourably considered and awarded the bid despite having quoted a higher price and this is quite encouraging. While this may not be big factor it does encourage us as an organisation to pursue environmental responsibility even more so in order to sustain business relationships with our clients as well as the possibility of new opportunities although this is not guaranteed.

#### What is your understanding/definition of GSPs?

From my point of view, I think green shipping does not start with us, it starts with the clients. If you want to be really green, then the green idea would have to be imposed on every aspects of the commerce and I am not sure how realistic that is. This will include exploring ways to minimise your shipping, shorten shipping routes, minimise TEUs, explore more effective ways to deliver product and minimise transportation/number of vessels used etc. I particularly think that it is the collaborative effort of all parties within and outside the shipping supply chain to ensure a more efficient transportation of goods with the least possible impact on the environment. The shipping lines cannot effectively do it themselves and I am not suggesting a drastic decrease in the usage of road transportation as it is the largest producer of emission because this will mount intense pressure on the shipping lines however, there is a need for collaboration between all stakeholder to effectively tackle global environmental pollution. In addition, to this as long as shipping lines are doing all that they really can it will certainly impact on the reduction on environmental degradation and in this instance I envisage that one profound advancement in the reduction of the number of vessels used with the emergence of mega vessels which are now beginning to see application on some routes and mega ports which will also emerge in the future. This will cause a shrink in the number of vessels plying the

water way. With the increase in number of mega vessels, mid size vessels will gradually disappear leaving us with smaller vessels (2500, 3000 or at the most 4000 TEUs) which will serve as feeder vessels and so I see feeder sector increasing in capacity. The Mega Vessels will be able to carry more containers on the same vessels at the same time and this will reasonably reduce emission per container per TEU of the containers been transported. In addition to this the future will see the introduction of new generation and more efficient engines, research into cleaner fuels, alternative ways to power vessels (solar, wind etc.) and other options, will also result in a reasonable reduction in the use of fossil fuels as well as reduction of number of vessels used which will ultimately impact on emission.

#### **What Green Shipping Practices do you have in Place?**

The environmental manager will be in the best position to answer that question, but I know that we are heavily carrying out a lot of improvements works on our vessels in order to be certified as well as meet IMO regulatory standards. In addition to these, there are several other regulations and restrictions that we adhere to. Our position in the market being a liner and feeder service somewhat constrains our ability to compete when we have to observe all these regulatory requirements being put in place since our competitors are not particularly as interested in environmental practices. I can however still say that we are still very successful as a good number of our clients appreciate our environmental efforts. There is still more we can do such as to participate in global discussions regarding environmental sustainability particularly so because the SECA region could expand to the Mediterranean because we are not too far, we should be ready and I think we are already doing so (to be best of my knowledge). So we are investing in our vessels to meet the criteria set the SECA zone for CO2 emission. We are also a part of CCWG and every year we publish our results and they give their comments and recommendation as well as expectations. I think what we need to do more is to keep in touch with the global players because they have the blue prints and the future plans for maritime environmental sustainability. We should be investing in vessels, infrastructure and global trends in this regard.

#### **Is the adoption of GSPs reactive or Proactive? Explain?**

I think we started with “we have to do it” but now seeing the global trends it is now a welcome idea and we are all happy to carry on doing it. It started as a reactive process but now it is proactive because we can't ignore what is happening globally. If we ignore the realities, we will be out of business. In fact, we have to keep up with the changing regulations in order not to be caught unprepared. The regulatory bodies are quite strict and when sanctions are imposed it could be really detrimental. Recently, about last year, a regional carrier in US closed up because their vessels were really out of date and the regulation demanded that their CO2 emission must reduce significantly to which they could not cope so they sold the vessels and closed the business.

#### **Is green shipping common/widely acceptable in the shipping Industry?**

I would like to say it is now widely accepted, because the majority consist of about 95% of the whole liner shipping sector and they are very involved in this concept already so the influence of the remaining 5% isn't very significant even if they have an opposing opinion.

Is there a defined department for Environmental Management? How does this department function? To what extent?

In this company what we have is a person that has the responsibility of the environmental manager, we don't particularly have a department. In other parts of the business, they have a department because they are more established.

How is GSPs monitored? Reported? Improved?

Frankly, I have no idea how that is done. We are a more client oriented department but we request what ever information that the clients ask for and then present it to the client. Also when CCWG shares their results, they share with us and with every other party that requires it.

Do you have target for your Green Efforts? What are these targets and how well are you performing?

The results are shared with us but I am not very intimated with the details of the results.

Who are the major competitors to your organizations? Are you aware of GSPs adoption/implementation in these organizations? Did this influence your decision to adopt GSPs?

I think it is part of the equation but as I said earlier the main motivation is from the customer. It is more of a selling point rather than the influence of competitor. It is more about continuity of the business. I believe this could be a reality for more so for the global players because they are the leaders in this business but for us, we are mid size players are more likely to replicate the patters laid out by the big players.

What is the leadership's perception to GSPs? (Supportive/Indifferent/ Non-supportive) Explain....

I think my perception is that they are very supportive. This company is owned by a family and it is not very common that a family company will be very developed in this aspect because it is a one-man show. So the considering his company as such the support from the top is very positive.

What is the managerial perception to GSPs? (Supportive/Indifferent/ Non-supportive) Explain

I would say in our department and at the management level particularly with departments that are in close relations with environmental issues the perception is also very positive. With respect to other distant departments it may be quite indifferent. Generally, being green is not a common business culture in Turkey so the popular idea would be indifferent and so the idea would have to be learned. Hence it can be said that being green isn't particularly driven by the work force however when they learn the idea then they can further drive it.

In your opinion, are GSPs necessary?

Yes, it is, I think it is quite late also and I don't know if all these efforts will make things better but I sincerely hope that there would be enough technology to sustain the future. It does appear as an effort to salvage an already pathetic situation. I am only very optimistic, because I fear we may have caused too much damage already. I think we will need to be stricter, it does appear that most governments are not in very much in support of the idea and every other person just seems to be taking care of business so eventually everyone loses.

Do you feel a moral conviction to be environmentally responsible?

I think we are hurting the planet and we have to make a change. I wouldn't want to be pessimistic about change but I don't know if our efforts would really matter. We can see the obvious effects of climate change and that cannot be denied.

Do you belong to any professional organization? Which ones? Does this influence your perception on GSPs and environmental practices?

I would say Yes it does because the more we get involved the more you see and understand and consider what needs to be done and implemented. The more exposure we get, it changes the way we think and act. People had been raising concerns about environment issues but now they are beginning to gain attention. I do hope that we can act quickly enough to remedy that situation.

Are there any internal pressures to implement GSPs? What are these pressures? How do they influence the decision to adopt/implement GSPs?

If there are, I am not aware. I haven't quite seen any such internal forum where this issue has been raised.

What is the attitude of the government towards GSPs?

I don't think the government is very concerned. Shipping isn't a very big sector in this country. In Greece for instance, shipping is very big. The number of ships owned by Turkish owners isn't very significant. Although we are surrounded by seas on all three sides, I think Turkish people are more land oriented people. The government is quite concerned and involved sustainable transportation but it is at a very minute level. The way this company is taking shipping sustainability is way ahead of the impact/concern of the government.

What are the Environmental regulatory organizations overseeing the shipping industry and what are the binding regulations?

As far as I know, I'm not sure if there are any such things.

Are there any punishment/fines/taxes imposed for violating Environmental regulations?

The thing about Turkey is that there are rules, but I don't know if there are specific rules about green shipping and there isn't much enforcement. It is not a cultural thing here so there is no pressure on the government to set the required standards. There could be such regulations but it is not very obvious. I don't see this in daily life or as issues discussed on common platforms. I would say it is a niche area in this country and we are still very much behind developed countries.

Do you consider these regulations effective?

No, In fact I am quite doubtful about the regulatory standards as well.

Do these regulations influence your decision to implement GSPs?

No it doesn't because as a company we are doing far beyond what the government requires from us. We are way ahead of the regulatory requirements

of this country with respect to the said topic. That is my opinion, because it is not an issue of priority in this country.

**Are your customers aware of Green Practices?**

Yes, but again coming back to what I do, we are in contact with very limited amount of clients and these are the biggest clients and they are very aware. Some of them are small companies and other are industry leaders but I can say that they are aware and depending on their size, some pay more attention to it than others. For most of them, it is in their company culture and so sustainability is included in their business relations.

**Do they demand for environmental accountability in your business practices?**

Yes, some of them demand strongly while other are mild. About 25% to 30% demand strongly for environmental accountability. About another 25% are quite uninterested and the middle 40% to 50% probably just ask to meet the business requirements.

**Does this influence your decision to adopt/implement GSPs?**

Of course, It does as I said in the beginning but it is not the only reason. I think as a company we see as a necessity for the continuation of our business and as a moral commitment to the world at large.

**Are there any benefits for the adoption of GSPs for the organization? Explain**

Yes, I think there are undeniable benefits. As long as the regulations are put in place and are strictly adhered to. The benefits of the GSP adoption will continually be reaped even more so on a global scale.

Commercially, it makes us a more likeable company, so it is a good point of sale. Of course implementing GSP also provides us a more efficient way to run our vessels which helps us save more which is a huge advantage. It sorts of guarantees our sustainability as a company as this is becoming an increasing business culture around the world. There is also the feeling of fulfilment doing business in a trust worthy manner which is a huge point of differentiation from our competitor. So it is a competitive advantage for us with our clients.

**Does this influence the decision of the organization to implement GSPs?**

I would like to think that it does, to the best of the information I have I would like to think it does.

**Do you consider the adoption/implementation of GSPs a constraint to your operations/business?**

No I don't think so. I don't think it is a constraint because our clients understand that this comes with addition expenses for instance using cleaner fuels cost about a third of the price more than the common fuels. It is however necessary that governments enforce strict regulatory requirements across aboard in order to level the playing ground between all business players as well to ensure the success of this initiative.

**What is your job description? How does it influence the adoption/implementation of GSPs?**

Global tenders Manager, I am responsible to perform tenders, manage communication and develop communication with the clients as well as manage the bidding process. SO we manage all aspect of tenders (sustainability, commercial, law and non conformity, KPIs, operations and payment) until the tender is finalised and when we can relay this information to the agent who is to execute according to the agreed terms and conditions.

**What is the impact of GSPs on your business/operations?**

Majority of our clients require knowledge of our environmental practices so I have to incorporate that into our business relations and quotes that we give to our clients.

**What is the size and capacity of this firm?**

**Does this firm belong to any environmental organizations? Which ones? What role does this firm play in those organizations?**

**Does this firm have any environmental related certifications? Which ones? What led to obtaining this certification?**

Not yet but I think it is in the plans of the company to acquire these certifications. And I think it will be a good way to show proof of our environmental efforts.

**What is our highest level of education/ certification?**

**What is your Gender?** M

**Years of shipping service experience/business.** 13 Years

**TABLE 3.2 LIST OF INTERVIEW PARTICIPANTS FROM CASE ORGANISATIONS**

(Source: Personal collection from Participating Organisation)

<b>ROLE/POSITION</b>	<b>JOB DESCRIPTION</b>	<b>YEARS OF EXPERIENCE</b>	<b>COMPANY</b>
Environmental Policies Manager	Responsible for all Sustainability and Dangerous Cargo operations	6	Alpha Line
Ship Management Specialist/Operations Manager	managing the performance of a vessel; ensuring	11	Alpha Line



	the safety of the vessel; monitoring voyage speed and fuel consumption; Prepare voyage schedules & estimates for optimal operations		
Ship Management Specialist/Operations Manager	managing the performance of a vessel; ensuring the safety of the vessel; monitoring voyage speed and fuel consumption; Prepare voyage schedules & estimates for optimal operations	11	Alpha Line
Ship Management Specialist/Operations Manager	managing the performance of a vessel; ensuring the safety of the vessel; monitoring	11	Alpha Line



	voyage speed and fuel consumption; Prepare voyage schedules & estimates for optimal operations		
Ship Management Specialist/Operations Manager	managing the performance of a vessel; ensuring the safety of the vessel; monitoring voyage speed and fuel consumption; Prepare voyage schedules & estimates for optimal operations	9	Alpha Line
Global tenders Manager	Perform tenders, manage communication and develop communication with the clients as well as manage the	13	Alpha Line

	bidding process		
Environmental Manager	Responsible for all Sustainability and Dangerous Cargo operations	30	Gamma Ports
Ship Management Specialist/Operations Manager	managing the performance of a vessel; ensuring the safety of the vessel; monitoring voyage speed and fuel consumption; Prepare voyage schedules & estimates for optimal operations	8	Gamma Ports
Ship Management Specialist/Operations Manager	managing the performance of a vessel; ensuring the safety of the vessel; monitoring voyage speed and	7	Gamma Ports

	fuel consumption; Prepare voyage schedules & estimates for optimal operations		
Ship Management Specialist/Operations Manager	managing the performance of a vessel; ensuring the safety of the vessel; monitoring voyage speed and fuel consumption; Prepare voyage schedules & estimates for optimal operations	10	Gamma Ports
Planning Assistant/Operations Officer	Assist Ship Management (doc/reporting)	2	Gamma Ports